The Commercial Car Journal

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Army Motor Trucks at Fort Sam Houston, Texas

Preparedness of the Automobile Industry

Readiness to Serve Manifested on All Sides

By LEN G. SHAW

DURING the Mexican border trouble the president of a big automobile company in Detroit was handed a telegram from the War Department in Washington, asking how quickly a given number of trucks could be shipped south. The president read the message quietly, signed his initials across the bottom of the blank, sent it to a subordinate, dictated a reply and returned to the consideration of the matter that was occupying his attention when the momentary interruption came.

Twenty-four hours later a long string of flat cars loaded with trucks, ready for action, and a sufficient number of Pullmans to accommodate the men required to handle the trucks after they reached their destination, stood on the siding running into the plant, a giant locomotive puffing impatiently at the head of the line. A call for volunteer drivers and mechanicians had gone through the factory, and before the rush could be checked, enough skilled men had offered their services to have cared for five times the number of trucks dispatched. To a salvo of cheers from their envious shopmates, who had assembled to see them off, the men selected clambered aboard and the train pulled out on a schedule which landed it on the Mexican border in the same running time that would be required by the fastest passenger train.

That was one company's answer to the nation's first call for aid of this nature, and it continued as often as a requisition was made until this one maker had upward of eight hundred trucks in Uncle Sam's service along the Mexican border, and in Mexico as well; for nobody in any way connected with the Pershing expedition will ever forget the part motor trucks played in transporting men and supplies into and out of that country, and keeping open a line of communication with the base that lay far to the north, across the sandy wastes where even trails were unknown.

And this was only one among scores of automobile plants that within a surprisingly short time could have duplicated the performance. Several did, for that matter, as is shown by the fact that eventually no less than 2300 trucks were being operated in army and kindred services along the Mexican border.

Whatever views may have been entertained regarding the wisdom of our marching an army into Mexico and then marching it out again, the outstanding feature of the expedition was the demonstration of preparedness in one branch of American industrialism on which the eyes of military experts now are focused. For if it became necessary to mobilize a large number of troops at a given point in a hurry the automobile industry would of necessity be one of the first to be called upon.

That the industry would respond on the minute can not be doubted, for without exception automobile manufacturers have indicated their willingness to go the limit in support of the Government in the event of their services being required in any capacity. Only recently the head of the largest automobile company in the world, himself a pacifist of the most pronounced type, assured President Wilson that his plant is at the service of the nation any time it is needed, and that under war conditions it would be operated without a dollar of profit. This is the attitude all along the line, even among those who have been hoping that the United States might avoid an open clash with outsiders. The most comforting part of all this is that these men are not idle theorists or armchair experts on the particular lines in which they would figure. They know what they offer

Before the European war was even dreamed of, outside perhaps certain mili-

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taristic circles, American automobile manufacturers had delved deep into motor truck transportation and its problems, and had gone far toward solving them. When the war cloud settled there came a demand abroad for American automobiles and motor trucks that gave added impetus to an industry already working at top speed, and turning out the finished product in almost unbelievable quantities.

Within a short time American-made motor vehicles were doing duty on every battlefront. In Mesapotamia, in Macedonia, in the Balkan States, in Egypt, in Russia, Belgium, France, England and various other places can be found American machines, from the heavy duty trucks that transport arms and foodstuffs along the battlefront to the light ambulances that work their way as close to the front as possible. All this is a tribute to American manufacturers, and a guarantee of their ability to provide their own Government with means of transportation that will stand the wear and tear of modern warfare, than which no more gruelling test ever was devised.

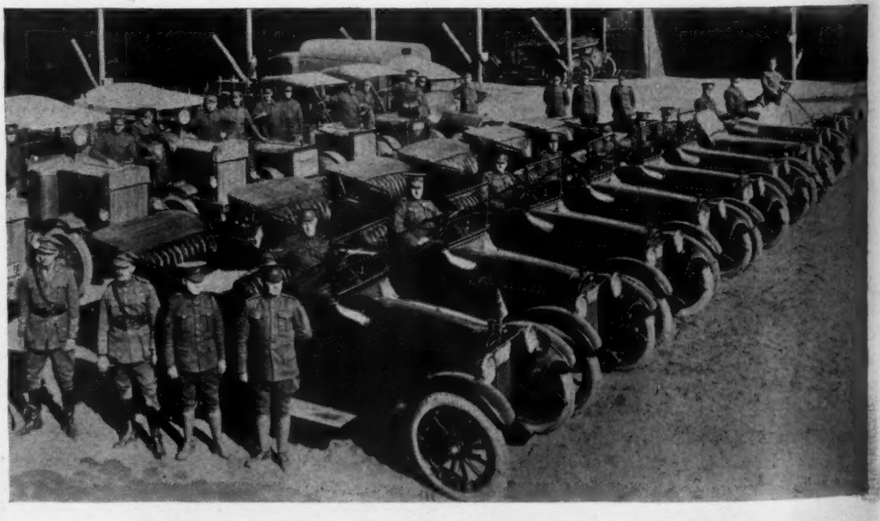
Packard Trucks on the Macedonian Front
Transport truck being towed back on the road

Just how many machines could be turned out in a given time is a matter for conjecture, because of the various elements that must be taken into account—material, labor, etc. However, some idea of the possibilities in this direction may be gained from what is being done today in certain plants. One is turning out each day 3000 light cars that in an emergency could be used to transport eight men each at a speed of 15 to 25 miles an hour over all sorts of roads, that could be turned into ambulances on short notice, or could carry machine guns or serve in various other capacities. At least two other builders are turning out 300 and more cars each daily, which could quickly be changed to meet military demands. Companies that are producing from 20 to 50 trucks a day, stand ready to heed the nation's call and turn over their entire equipment. And this applies all along the line.

It will readily be seen what this would mean in the event of the country being brought face to face with the problem of mobilizing any great number of troops for home service and keeping them supplied with foodstuffs and munitions, or if it became necessary to move them swiftly from one point to another, say along the seaboard, where the railroads, with all their equipment, could only be depended upon to carry part of the burden. Twenty-four thousand men, with all their necessary equipment, could be moved with the one-day output of a single factory, and in the aggregate the carrying capacity would be imposing. The same would apply to the transportation of foodstuffs and munitions, for thousands of trucks could be brought into use almost over night. Nor would this be an experiment, for every unit has been employed in Europe until just what could be expected in this direction is a matter of common knowledge among manufacturers and military experts.

Packard Army Truck With Double-Decked Radiator for Hot Climate

Another marked advantage this country possesses is in the thousands and thousands of expert mechanics that would be available the moment their services were wanted, just as when fleets of trucks were rushed to the Mexican border, Ten thousand men, even more if necessary, who know an automobile from end to end, could



Touring Cars and Military Trucks Used by Canadian Troops in Maneuvers at Camp Hughes, Ontario

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be enlisted, and would prove invaluable in the field.

One of the problems confronting certain of the allied nations at the beginning of the war was getting sufficient mechanicians to keep all the trucks in commission. It was not so hard to find drivers, but men who could diagnose a trouble quickly and overcome it were not so plentiful. American mechanics who went abroad with consignments of trucks, or who enlisted for service in the European armies, were eagerly sought out, and every inducement was put forth to hold them, because their value was speedily recognized. This handicap would be obviated so far as the United States is concerned, because high-grade men in sufficient numbers to care for every need are available.

This directs attention to another phase of national preparedness with which the automobile industry is closely allied. One of the hardest tasks imposed by modern warfare is keeping the guns supplied with ammunition, of which unbelievable quantities are required. It took England two years and more to get on her feet in this respect, and while that point was being reached, American manufacturers who sold munitions were getting a schooling that would prove invaluable to this country in the event of this nation needing their services. Automobile plants are equipped with the most modern machinery of every sort, and the introduction of special dies would made it possible to convert them into munition plants in short order. Many manufacturers have already tendered their plants, to the government, and in the event of munitions being required they would be found ready for the task.

But it is to another and a more recent development that the interest of experts just now is being directed. When the European war broke out even the most enthusiastic birdmen had no idea that aviation was destined to play so important a part as it has, or that there would come such a development of aircraft from delicately adjusted mechanism likely to go wrong on the slightest provocation to great fighting machines capable of making the fastest train seem snail-like in its pace, and equipped with rapid fire guns, wireless and all the other paraphernalia that has made them indispensable along the battlefront.

It is a sorry commentary on our boasted American progressiveness that a principle which was first successfully worked out in this country—that of flying—should be developed and brought to its present high state abroad.

Nevertheless, the lessons learned abroad have not been without their effect in this country. Of late aviation has made great advances, and considering the slight encouragement offered by those in high positions, and the handicap imposed by strict observance of patent rights, remarkable progress has been made.

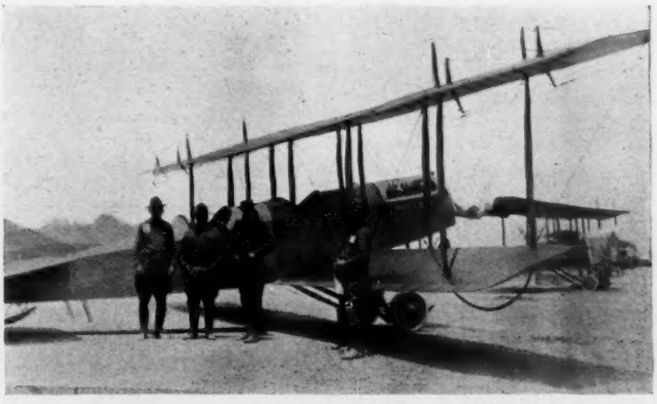
Plenty of people can build planes—high school boys turn out models that will fly with the assistance of nothing more than rubber bands, but the real problem is to get motors that will drive them through the air with sufficient speed, and that are dependable. Naturally the automobile industry, with its years of experience in the designing and production of gasoline engines, turned to the development of power plants for aircraft, and with good results. Several factories throughout the country are in a position to produce practical aircraft motors as soon as there is a demand for engines of this sort, and if the Government wanted an air fleet it could have it in short order.

Here again the industry that has made America world famous for the quantity and quality of its output looms strong, for there is not a single step in the production of aircraft of the most modern type that could not be done in automobile plants. As stated, motors are available, of all sizes from little scout planes of phenomenal speed up to those for fighting super-planes with a crew of several men and fitted with the most modern death-dealing devices.

When it comes to manufacturing and assembling the constituent parts the automobile industry will not be found lacking. Patternmakers and woodworkers will lend their skill to designing and constructing the wings, spars, struts and bodies. Upholsterers and trimmers will turn their attention to covering and doping the wings, and

Army Trucks Ready for Shipment from Packard Factory

Motor Trucks Transporting Mule Fodder



Type of Airplanes Automobile Plants May Build

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

the men who now put the finest finish on automobile bodies will perform like service for the aircraft. It is not unreasonable to suppose that should the demand develop makers would be turning out bodies for aircraft in the same quantities that they now produce them for automobiles. As for mechanicians, they can be had for the asking, far faster than the Government can train pilots.

In anticipation of what might happen, the Packard Motor Car Co. more than a year ago established a flying field one mile square on Lake St. Clair, just above Mt. Clemens. This field is now in shape for use, and will be used as a training base.

To do its bit in behalf of national preparedness, the Aero Club of Michigan, made up largely of automobile men who are aeronautical enthusiasts, has begun enrolling recruits for the different vocations required in the aerial service, so that when needed it will be possible to mobilize on short notice a force of men skilled in all the duties that they will be called upon to perform.

Building Taxicabs a Successful Chicago Industry

WITHIN the past season, the Shaw Cab Mfg. Co., of 300 E. Huron Street, Chicago, has completed a remarkable production record by assembling 856 taxicabs, valued at approximately $1,500,000, on a floor space of 9360 sq. ft. This remarkable record on a limited floor space area places this concern in the front ranks as successful builders of taxicabs.

This daily output of four machines was attained only through the employment of highly skilled labor for assembling the different parts, such as engines, transmissions, rear axles, bodies, etc. An endless chain system of labor efficiency was instituted for producing the daily output of four machines. One of the greatest difficulties this concern encounters in connection with their limited manufacturing space was the arranging with the manufacturers of supplies for all the necessary parts in such quantities as to keep a week's supply of stock on hand. In building these taxicabs the price of units was a secondary consideration in comparison with the quality. Among the units used to build these taxicabs are the following: Continental engines, Brown-Lipe transmissions, Timken-Detroit axles, Gemmer steering gears, Long radiators, Smith frames and Racine bodies.

Chicago is the greatest world's taxicab center, as her "Yellow Cabs" and her "Black and White Cabs" have solved the motor livery problems of the many American cities they are used. In fact, they have standardized and nationalized taxi service, and have made it a popular and low tariffed public service. So far has their fame extended that Shaw built taxicabs are pleasing patrons in New York, Boston, Philadelphia, Cleveland, Kansas City, San Francisco, and, of course, the Chicago public look for and patronize these standardized vehicles of a surpassing public service. They are typical products evolved from the Shaw Mfg. Co.'s long and successful experience in maintaining rapid, safe and comfortable public service motor vehicles.

MAJORITY OF PUBLIC ROADS ARE OF EARTH, SAND-CLAY AND GRAVEL

The Office of Public Roads and Rural Engineering of the United States Department of Agriculture recently gathered statistics to the effect that nearly 2,400,000 miles of the 2,500,000 miles of public roads in the United States are of earth, sand-clay and gravel. Roads of these materials are, therefore, of predominant importance in most communities of the country and probably will remain so for many years. For this reason the office of Public Roads and Rural Engineering has issued a Department of Agriculture Bulletin, No. 463, a comprehensive discussion of the materials, methods of construction and maintenance for the three types.

Most roads are located originally as earth roads, the bulletin points out. In such location work, the fact that the road eventually may develop into an important highway should be kept constantly in mind and routes should be chosen which will not have to be radically changed, perhaps at great expense, at some future time. The tendency in many rural communities to locate all new roads along land lines has been responsible for much waste, it is pointed out.

The importance of grade, drainage and width of roads, as well as the materials of which they are built, is emphasized in the publication, and the machinery and tools used in constructing roads of the different materials are described. The necessity for adequate maintenance is brought out, and in this connection directions are given for the making and use of road drags. Typical specifications for the construction of roads from earth, sand-clay and gravel are included in an appendix to the bulletin.

MAKING A BUSINESS OF BUILDING TAXICABS

These Departments Turn Out Nearly Nine Hundred Taxicabs Annually.

Invaluable Service of Trucks in the War

United Motors Manager Reports, From Personal Observation, Decisive Part They Are Playing

[Certainly one of the most, and probably the most, enlightening account of what is being accomplished by motor trucks in the military operations of the Allies is given in the following, based on an interview with the general manager of the United Motors Company, who has just returned from France.—Editor.]

A GRAPHIC story of what motor trucks are doing in the great European war, which strikingly illustrates their possibilities should present American conditions develop, comes from George P. Sweet, general manager of the United Motors Co., of Grand Rapids, Mich. Mr. Sweet but recently returned from France where he spent two months in intimate study of trucks in use in the war zone. Summing up this study he made the declaration that the vehicles, and particularly the heavy-duty cars, are absolutely indispensable, and that, but for their service, no perceptible progress could be made.

Allies Using Vast Number of Trucks

At present there are approximately 40,000 motor trucks used by the Allies in France. Most of these vehicles are 3½ to 5 tons capacity, although many 1-ton and ¾-ton machines are in evidence. They are employed for every conceivable duty, from the transportation of men and supplies to conveying ammunition and ordnance. Chiefly, the trucks have been available for the moving of ammunition and for active belligerent service. More than 1,000 are used as mountings for the famous French "soixante quinze," (75-millimeter) guns, for anti-aircraft guns and for searchlights, and in these particular capacities they have proved their indispensability. Before the battle of Arras trucks moved over 300,000 tons of explosives and shells to the battle line and but for that service only a fractional amount of this material would have been available.

In the active military maneuvers the trucks have grown to be an institution and are the prime objects for the concentration of German gun fire. So important a part do they play that the Germans direct every effort toward destroying them and also the main pikes over which they proceed. Not more than a month ago the Germans, learning the location of a dozen crossroads through their airmen, shelled these points persistently for several days, ultimately rendering them impassable. The Allies, however, maintain such an efficient corps of roadbuilders, that they quickly repair any damage that is done. German airmen, armed with bombs, constantly attempt the destruction of the truck trains and in many instances they are successful. The loss, during three years of war, has been over 50 per cent. in truck equipment.

Two-ton trucks are used mainly in combatting the German fliers. These carry huge searchlights, 3 ft. in diameter with dynamos to operate them, and are manned by three men each. They course up and down the roads at night sweeping the heavens with the glare. Other trucks, fitted with anti-aircraft guns, follow close in the wake and do their duty whenever an enemy plane is sighted. In this way the Allies have been able to block numerous raids and have effectively halted many German air enterprises which, had they gone through to completion, would have been disastrous. But for the trucks, fitted as they were, such resistance would have been impossible.

Numerous trucks are used as mounting for large calibre guns which are fired in active warfare from the truck deck. It has been possible to run these trucks up to a good range and utilize the guns for hours in bombardments. With the close of the bombardment they were quickly withdrawn out of range. These trucks are put to an exceptionally heavy strain, the guns rearing the vehicles on their rear wheels. Despite this fact, however, they have stood the test well and have proved more than profitable. It is not uncommon to see a hundred or more of these cars lined up along some particular sector discharging screaming shells into the German trenches. And, within five minutes after they cease firing, they have disappeared, leaving the broad earth only as the target for the German shells that respond as soon as the German gunners find the range. The effectiveness of this class of firing has been watched by airmen and it has been rated as highly efficient. And it is carried out with about 10 per cent. of the loss that is sustained in connection with stationary positions.

Trucks Painted to Elude Enemy Airplanes

For transporting food, supplies and soldiers from the various camps to the front, the trucks have been extremely valuable. All the cars used in this branch of the service are painted in a novel fashion. The idea is something after the cubist or futurist style, broad, uneven stripes of green, purple, yellow, black and brown running over the entire unit. Interspersing the stripes are large blotches of some high color. This scheme, although grotesque at close range, is baffling to the German airmen. It gives the vehicles much the appearance of the landscape and they consequently go back and forth without so readily becoming targets for bombs and shells. It is this idea alone that has saved the French and English thousands of lives and thousands of trucks.

The trucks used in this branch of the service are fitted with prairie schooner tops. These tops serve as a protection for the supplies and the soldiers. Tons of wholesome food, in good condition, dry clothing and other incidentals are transported from Paris to the various sectors in less than a day. Hence, with these trucks, a service to the fighting men is maintained that is comforting and inspirational. For the moral effect alone the trucks in this connection have been invaluable. All of these cars are fitted with boards, two feet wide, which run the length of the body. These, when troops are being transported, are used as seats. When a cargo of supplies is taken on they are collapsed at the sides and are out of the way. Steps at the rear give the vehicles the appearance of the old-fashioned carryall. In fact, while carrying troops they might just as well be taking a load to a Sunday school picnic, as far as appearance is concerned. This idea, particularly with the French, has been found to be worth while.

Rapidity of Motor Service Has Decided Engagements

During the past year thousands of trucks have worked right up to the line of battle in many cases. At present this is impossible because the mud is from five to thirty feet deep. Several cars, attempting to negotiate certain stretches, have been swallowed up completely. Practically all of the ammunition has been transported to the fighting fronts from Paris and other store stations by trucks alone. Very little of it is moved with horses, as the animals are unable to stand the severe strain of the going. With the almost countless number of trucks in operation it has been possible, on many occasions, to provide stores of munitions which have decided engagements. The rapid movement, with the enormous capacities, have been the main virtues. As in the case before the battle of Arras 300,000 tons of munitions were moved up in a comparatively short space of time. All this was on hand when the firing began the first day. Such a condition would have been considered entirely out of the question if dependence had been necessary on the old horse-drawn methods of transportation. It is this feature that has made the trucks the institution that they are, and it is this feature that led Mr. Sweet to declare that the war never would have gone as far as it has and never could be continued but for them.

During the first part of the war countless trucks were lost to the Allies because of the lack of service stations. A shell, exploding, would disable a vehicle and it would be abandoned. If some defect developed that rendered the vehicle unfit for service it would be dynamited. Now this condition has been changed, and numerous service stations, equipped with machinery

and tools and harboring the best mechanics in the Allied armies, may be found. Every truck is equipped with a trailer coupler in front and rear and if it is disabled it is quickly hooked up to the first active machine and towed to the nearest station. In this way an enormous amount of supplies and hundreds of trucks have been saved. The trucks are also equipped with a V-shaped piece of heavy steel, four feet long, of great strength, which may be dropped at any moment by the driver. If a stop is made this arrangement holds the truck secure in its position. If it is descending a hill it may be halted and held secure where brakes would be of no avail. The invention makes the machine doubly stable. It is operated by a lever from the driver's seat and is located at the center of the wheelbase.

On at least 500 trucks now in service the French have mounted winches and these machines are used for rescuing disabled cars, dragging captured cannon and all sorts of work that requires pulling power at a distance. The winches are equipped with a powerful steel cable, in many cases a mile long. This is fastened around the objective point by soldiers and the winch does the rest, the truck being held stationary by the V-shaped contrivance. This rescue work, carried on at a distance of from half a mile to a mile and even more, is done in comparative safety. As fast as the recovery is made the objects are removed by the truck to a point of collection. Such equipment has been responsible for the reclamation of many enemy guns, trucks and other heavy and unwieldy objects of the field.

Monster trailers have also been a big feature of the war. These units, invariably running on four wheels, are hauled in lots of from five to fifteen by the big 5-ton trucks. It is common to see from 50 to 100 trains, a truck and a number of trailers, loaded down with supplies, leaving Paris for the front. These trains, all painted in the grotesque fashion mentioned previously, present an unusual sight. Their effectiveness is a matter of record and when the war is over a big share of credit will be accorded to them.

Germans Cleverly Conceal Truck Trains

In this connection it is interesting to note the Germans and the Allies use every possible method to protect the trains. Recently Allied birdmen were the victims of a clever German ruse. During the night the Germans stretched fully five miles of canvas from a particular base of supplies to an important point along the firing line. The canvas was 15 ft. above the ground and under this the Germans operated their truck trains during an entire day transporting supplies to the strategic point. The French airmen, flying at a height of 10,000 ft., thought the canvas was a road and they were unable to detect the operations going on underneath. Only by accident, on the second day, did they discover the German cleverness. When they did a few well-directed shells stopped the performance.

During the recent coal famine in France the trucks in army service won much praise. This famine came at a time when France experienced its first real cold weather in 40 years. In some spots ice froze on the rivers and ponds. The natives, unused to the severity, suffered untold agony. The coal supply was low at the outset and it was quickly consumed, and the need for more grew more urgent every day. The Government quickly placed a number of trucks in service and the coal was transported from the supply bases to the little towns and villages that were hit the hardest. By means of this transportation much of the suffering was alleviated. Although many deaths, particularly among infants, were recorded as a result of the famine the casualty list was far from as large as it would have been if the truck service had not been available.

Pleasure Cars and Motorcycles Also Extensively Used

Pleasure cars have also played an important part in the war. Practically the entire output of the French factories has been absorbed by the Government. These are used, along with light trucks with special bodies, for ambulance service and in transporting troops. Officers use the limousines and closed cars and every day one may see dozens of these big cars, which, in a good season, would command a price of from $5,000 to $10,000, speeding the army heads out to the line of battle.

Motorcycles and even bicycles are also used generously. These machines are adaptable for dispatch work, and can be operated where a heavier vehicle could not go. With the motorcycles the Allies have inaugurated a 4-copy system for all dispatches. Each of the copies of the message is given to a rider and the four are dispatched along different routes to the destination. At least one copy is fairly certain to reach the objective point. This idea is insurance against absolute loss and is one that has been the means of bringing about a big measure of success.

The operation of trucks in France is very expensive. The cost of materials is high and the problem of securing parts is one of the keenest. Gasoline sells for 80 cents a gallon and is of an uneven and low-grade variety. Used as extensively as they are, the trucks are one of the biggest sources of expense. Yet, despite the abnormal cost, they are considered so indispensable that new machines are being added daily and the total, if the war keeps up another year, will be close to 75,000.

Considered from every angle the motor truck in the war game is the leading factor. And, according to Mr. Sweet, it will play an even more important part in the United States if present belligerent conditions continue to grow. In France the Allies use trucks for every conceivable movement. Unable, as they are, to operate railroads to any degree of satisfaction, the trucks pick up the work where the railroads leave off and even go so far as to enter stiff competition where the roads are in good condition. With the railroads there is always the problem of congestion. It cannot be averted. With the trucks this problem has been entirely eliminated. They move with freedom from any point and over any sort of territory. They make greater speed and carry heavy tonnage. In fact, from every viewpoint, they are invaluable.

Road conditions and service stations are the two big features that must be considered in the operation of trucks in war time. If the roads are not good the movement is hampered, and if service of a satisfactory nature cannot be rendered the loss is tremendous. The French and English employ thousands of men in their road construction corps. And they protect the roads jealously. All parts of the country are kept under surveillance and if the weather department scents soft weather an alarm is sent to every road station. The men in charge then act accordingly. Hundreds of soldiers, on trucks equipped with shovels, scoops and roadbuilding tools, patrol the roads. If a shell falls and disarranges the levels the repairs are made at once. To this feature of maintenance may be attributed a big share of the success of the truck in France. And with adequate service stations for adjustments and repairs on the cars, the efficiency has been increased to the maximum.

Many American engineers and truck men have investigated the truck operations in France and they will incorporate many of the ideas gained in vehicles which may some day be used by the United States Government. The investigations have been made to ascertain the adaptability and availability of the truck. Mr. Sweet talked to a number of these men and the consensus of opinion was that no war could be conducted successfully without the big motor vehicle. In every department of service it has proved itself worth while, from the transportation of men to active use in bombardments and work along the firing line. It is just as Mr. Sweet put it: "The motor truck is indispensable," and it has a place, next in importance to munitions, in modern warfare.

PROTECTIVE LIGHTING FOR INDUSTRIAL PLANT, is the title of a booklet just issued by the National Lamp Works, Nela Park, Cleveland, O., as a result of the large number of requests received by this company as to the best use of lighting as a precautionary measure against damage to industrial plants. The booklet has been written with a view towards preventing the misspending of thousands of dollars on the part of the nation because of incomplete knowledge on the subject of protective lighting.

THE BUREAU OF FOREIGN AND DOMESTIC COMMERCE is making a study of the export problems of the automobile industry and in this way will be able to render assistance to American manufacturers of motor vehicles in marketing cars in the Far East. Markets in China, the East Indies, Africa and Australia are to be investigated by Mr. Tom O. Jones, special agent. Before sailing he will visit the principal automobile centers in this country to familiarize himself with the needs of individual manufacturers. Exporters who wish to consult Mr. Jones during this preliminary period should address him at Room 409 Customhouse, New York City.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

Taxi Company Establishes Welfare System

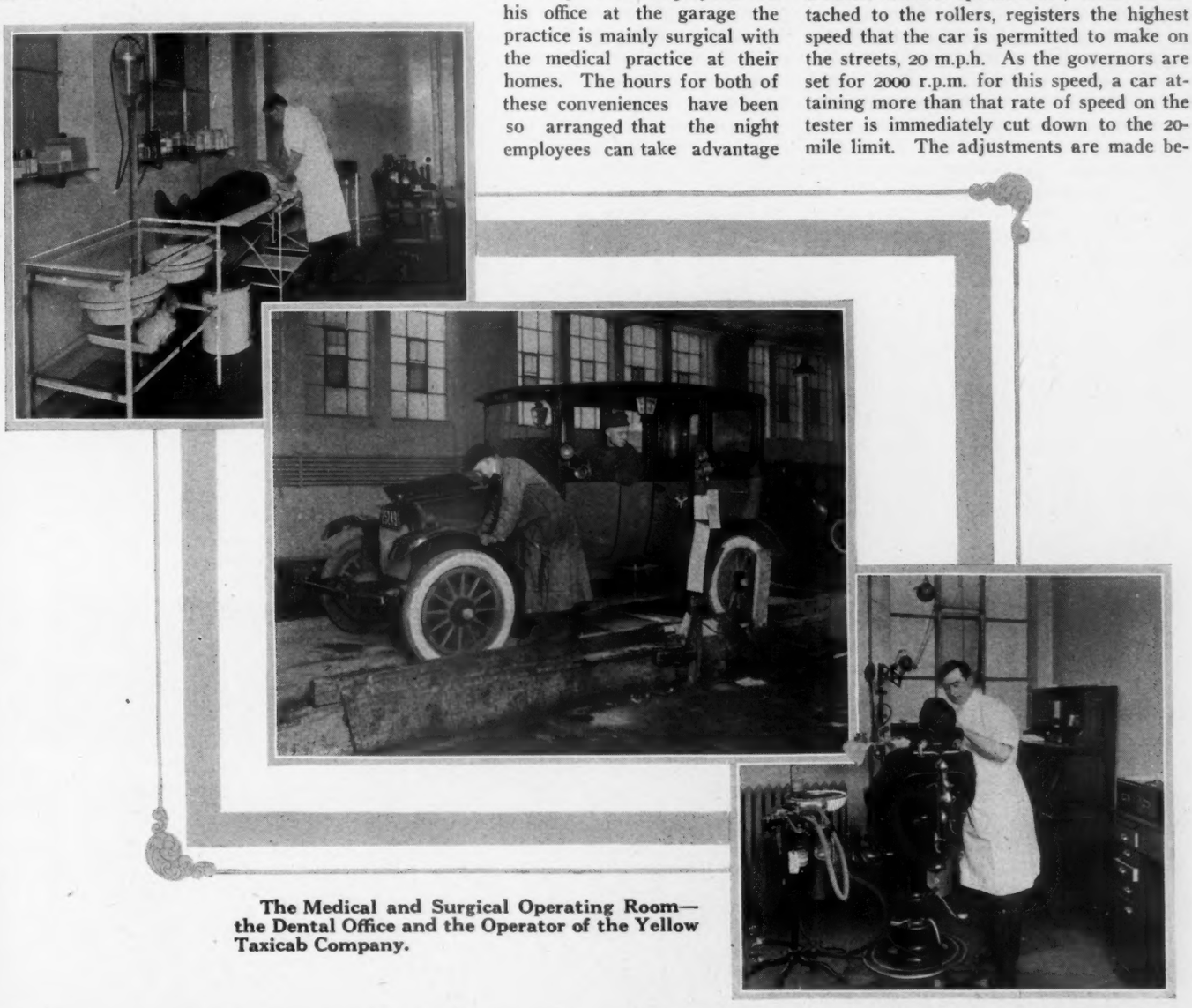
Dental Work and Medical Treatment at Cost. Employees Compelled to Undergo Medical Examination Twice Annually

By GEORGE BROWN

THE successful operation of a metropolitan taxicab service, in the opinion of John Hertz, manager of the Yellow Cab Co., of Chicago, is incomplete without humane ideas regarding the care and use of the human equation necessary for its maximum efficiency.

In making additional installments to the equipment of its garage, which apparently had all modern devices for economy and convenience, a completely equipped dental office, in charge of J. Weinstein, D.D.S., has been placed in operation, entitling the 800 employees of the Yellow Taxicab Co. and the Walden W. Shaw Co. to free service, the only charge being for material. The dental office is open from 9 A. M. until 12 M. and from 6 P. M. to 8 P. M. While it is not obligatory for its employees to patronize this or the medical department, they are compelled to either take advantage of these modern garage opportunities, or select their own medical or dental advisor when necessary, as the company directs.

The medical and surgical operating room is in charge of Joseph Urkob, M.D., with the same hours as the dental office, although the doctor's services are available at all hours for any of the employees. In his office at the garage the practice is mainly surgical with the medical practice at their homes. The hours for both of these conveniences have been so arranged that the night employees can take advantage of them during the day and the day men at night. All employees must undergo a physical and dental examination twice annually, either at the company's hospital or from their family advisors; in the latter event a written certificate must be produced.



The Medical and Surgical Operating Room—the Dental Office and the Operator of the Yellow Taxicab Company.

Taxicab patrons, as well as garage owners, may be interested in the Yellow Cab speed tester, which is a device installed on the main floor of the garage, and consists of a platform with an incline plane, or driveway, on each end to drive the car on and off. When in a position for a speed test, the car's rear wheels are in contact with two steel rollers, which revolve as the car is put under its own power, and the Stewart-Warner speedometer, which is attached to the rollers, registers the highest speed that the car is permitted to make on the streets, 20 m.p.h. As the governors are set for 2000 r.p.m. for this speed, a car attaining more than that rate of speed on the tester is immediately cut down to the 20-mile limit. The adjustments are made because, at times, worn gears on the governor necessitate replacements before it will act in an efficient manner. The device is an effort to make it an impossibility to drive a taxicab to exceed 20 m.p.h. Every cab is tested every day, oftentimes both going and returning. A fleet of 432 cabs undergo the test.

Everybody who is anybody in the truck industry reads the CCJ

Efficiency of service and quality of construction of Shaw-made taxicabs is such that over 97 per cent. of them are constantly in commission on the streets, excluding those undergoing repainting.

In the annual audit of the Yellow Taxicab Co.'s books the auditors questioned "Why no depreciation?" Why? Because the main object of the Shaw Co. is to keep every unit of its fleet as a wage-earner and a dividend payer. The lack of depreciation exists from the system inaugurated and maintained to replace any broken, worn or defective cab-unit, at once, with new or extra part, from engine to cotter-pin. The cab, with only a slight detention from duty, keeps regularly at work. The working cab pays the dividends. The repairs and replacements are charged to the cab while it is earning far more than any repair cost. Time is money with the Yellow Taxicab Co.—for them, for their employees and for a great public receiving a low-fare rate and satisfactory service.

Gasoline an Aid to Chicago's Public Service

By GEORGE BROWN

THE Chicagoan always has before him an unsolved transportation problem, and with all the investigations and efforts for its solution for many years past, up to the present time nothing appeared to reduce the number of strap hangers other than the always crowded systems of the surface and the "L" structure. A subway seems nearer than ever, but all of these systems are and will be electrical and on rails. Now, however, relief comes through gasoline by the operation of a motor "bus line.

For almost a year efforts have been made to induce the proper authorities to grant a franchise for the operation of motor 'busses through the park and over the boulevards. At last the Commissioners of Lincoln Park, Chicago's great North Side beauty and recreation spot, recognized the great and growing demand for improved transportation facilities to accommodate that part of Chicago's population adjacent to the Lincoln Park district, and granted a twenty-year franchise for the continuous operation of a new public service, to be conducted by the Chicago Motor 'Bus Co., which will traverse the route designated by them in the ordinance they have granted.

The 'busses are somewhat similar to those operated on the Fifth Avenue line in New York, although their construction is as much different and more up to date as is even their use, for in New York the line is really a popular luxury, while in Chicago the successful effort should prove a popular necessity.

It was planned to start operations with a fleet of 50 vehicles, but owing to the railway freight congestion only eleven 'busses arrived in time for the beginning of operations, which was at 1 P. M. on Sunday, March 25, 1917. The company believed it better to begin with this small number to show an earnest of its intentions and to accustom prospective patrons to the superiority of the service, while they are making all possible efforts to expedite the delivery of the remainder of their initial order.

With these eleven cars in operation it will be possible to maintain a 10 to 12-minute headway. Just as rapidly as more 'busses arrive they will be put into service,

Views of the Chicago Gasoline Busses
The body floor is set very low, eliminating the customary steps. A stairway in the rear gives access to the upper deck.

thus gradually cutting down the time between the vehicles, with the knowledge, that when the fleet of 50 machines is in operation, a 3 to 6-minute schedule will be maintained.

With the full complement of 50 motor 'busses in operation, a portion of the service will be "Express," to operate from Devon Avenue, Wilson Avenue and Diversey Parkway to the "Loop," a distance, as the crow flies, of about seven miles. This part of the service will make no stops between the northern terminals and Randolph Street, a block within the northern boundary of the "Loop." A "City-bound" express service will be furnished from 6 until 9 o'clock in the morning, while one "Homeward-bound" will leave the "Loop" beginning at 4.30 in the afternoon and continue until 7 at night. The service will operate continuously from 6.30 A. M. until 1.30 in the morning. As yet no schedule has been made for the running of "owl" 'busses.

Seats for All

The carrying capacity of these 'busses will be restricted to actual seating capacity, something unheard of in transportation since Chicago was called Fort Dearborn. The inside seats will accommodate 22 passengers, while there are seats on the upper deck for 29 more.

The 'busses are the latest word in motor coach construction. The bodies were built by the St. Louis Motor Car Co. from designs by Roland R. Conklin and Harold B. Weaver, who have achieved an epoch in public vehicle construction by providing Chicago with a "stepless" 'bus. The body color scheme is fawn with maroon and scarlet trimming, presenting a most artistic appearance; in fact, the company went to considerable expense to make this a service beautiful, as even the style of lettering is that which appeared on the New England stages of a century ago, and to still further carry out the color scheme the chauffeurs and conductors wear uniforms of regular United States Army olive drab, with maroon piping. Tan puttees, tan shoes and regular U. S. A. caps make the uniforms complete.

The vehicle weighs 10,200 lb. and yet is the lightest, per passenger, ever manufactured. The driving units are manufactured by the Gas Electric Motor Corp., 336 Avenue B, New York, and in the event of accident only a slight delay will be possible as the vehicles are in two units, and when the service is in full operation provision will be made to replace either unit expeditiously whenever trouble may happen. The engines are the latest and most improved type of the Moline-Knight model, manufactured by the Moline Automobile Co., East Moline, Ill. The springs are from the E. R. Merrill Spring Co., 52 West 28th Street, New York City. The steel wheels are from the Smith Wheel, Inc., 101-21 North Geddes Street, Syracuse, N. Y. The tires, by the Firstone Tire Co., are 34 x 5 in. pressed-on channel type motor tire.

"Safety First" will be an asset of the corporation, as they require all operating employees, whether chauffeurs or conductors, to submit to the most rigid physical and mental examination. Notwithstanding the fact that all chauffeurs employed are trained men they will nevertheless receive special instructions before they are permitted to operate the 'busses. The conductors will serve a probationary course in the company's school in order that every patron may receive courteous treatment.

It is the intention of the company to provide a number of special busses for social events. The interiors of these will be especially decorated as to curtains and all upholstery.

The Chicago Motor 'Bus Co.'s garage on Broadway, just north of Rosemont avenue, is a new one-story structure of brick, steel, cement and glass, erected at a cost of $40,000. The floor area is 100 x 150 ft., with ample space for 50 motor 'busses. An administration building in the rear and fronting on Rosemont Avenue, now under construction, will be two stories high and will include under its roof a repair plant, club rooms, reading rooms, lockers and shower baths for employees. It will cover a ground area of 85 x 180 ft. The ground cost for these two buildings was $40,000, while the administration building represents an investment of $100,000.

The Motor Truck in Army Service

By MAJOR-GENERAL JOHN J. PERSHING

EFFICIENT transportation is vital to successful military operations, for without it the combatant branches of an army cannot successfully function, and so by overcoming the enemy, carry out the object of their being. No matter how well trained, energetic and patriotic troops may be, they cannot operate without supplies of ammunition, food and other requisite stores. No matter how well organized and efficient the method of gathering supplies may be, unless the stores collected in various depots are placed in the hands of the man on the firing line with sufficient celerity not to hamper the mobility, which is a prime factor to successful military operation, the army will fail in its mission. The function of the transportation units of the army is to assure possibility of success by bringing without fail to the soldier at the front the things he must have. So it will be seen transportation, efficient in every way, is one of the major requirements one must strive for.

The layman does not conceive of the enormous trains which are found in the rear of armies engaged in field operations. These, in the days of animal-drawn wagons, were frequently over twenty miles from head to tail, congested the highways in rear of troops and frequently caused local failure of supply by sheer inability to make the needful mileage in the given length of time, by reason of slow speed. Again, the animal for traction, in turn, had to be fed, thus increasing the tonnage of supplies to be transported. Armies were, in consequence, limited in operation to those maneuvers possible when supplied under these conditions.

The advent of the motor truck and the road tractor with trailers had the effect, almost immediately, of materially increasing the scope of military operations on account of increasing the delivery capacity of the transportation units, by reason of increased celerity of movement, and also that the bulk of the cargo carried was primarily that destined for troops on the extreme front, and not for the maintenance of the train itself. A wagon train does well that averages twenty miles per day. A motor truck company will make three and perhaps four times this mileage. It follows that the tonnage delivery at destination will be in favor of the motor drawn unit practically exactly in this proportion.

The field of endeavor of the fighting units is broadened as the speed of the delivery of supplies is multiplied and so many operations that were formerly impossible are now undertaken with perfect equanimity. A concrete example may be cited in the operations of the recent punitive expedition into Mexico. By the use of motor-drawn transportation, in record time, the foremost troops of the expedition—which in all approximated some 12,000 men and 8,000 animals and required about 100,000 lb. of supplies daily—were enabled to penetrate some 300 miles into unfriendly territory and maintained the points thus held (the farthest point south actually reached was 500 miles from the border), a feat never before accomplished in history, where troops were not based on rail or water transportation. Without the motor truck, with its increased speed and carrying capacity, this result could never have been accomplished.

One has but to read of the operations in rear of armies now engaged in the European theatre to appreciate how dependent are these on motor-driven transportation.* Men are moved at heretofore unheard of rates of speed from one point to another where reinforcement is necessary, tremendous tonnages of ammunition and general supplies are dispatched to the places of eventual expenditure, the wounded are moved to the rear in orderly haste, and all this is due to the entry of the motor truck into the field of military operations. This country will do well to profit by these examples in pending operations, whatever they may be. The limited space available for this article does not permit a more comprehensive exposition of this subject, much as it deserves elaboration, but it can be asserted without fear of contradiction that the motor-propelled vehicle as a factor in army transportation has come to stay, and if we properly develop it, to be one of our greatest aids to true efficiency.

*This is strikingly borne out by the article on "Invaluable Service of Trucks in the War," page 3.

Opportunity comes to the well-informed. Read the CCJ

The Commercial Car in the Army

By R. E. DOWNER

THE truck has come into the United States army in two general ways, by the order establishing motor truck companies and by the gift of one or more trucks to a favorite company or regiment of the national guard by popular subscription in the community where the unit is at home.

The motor truck company was organized last June and demonstrated its efficiency along the Texas border. Sixty-six men constitute a truck company—two officers, four men on motorcycles and 60 men operating 30 trucks, two men to a car. When a regiment moved from Pharr to McAllen, or from Brownsville to Mission, or from somewhere else to some other point in the border maneuvers last summer, the truck companies did the heavy work.

The 74th New York Infantry was moved in this fashion from Pharr to McAllen. A truck company was detailed to move the tents, cook shacks, mess shacks, ammunition, ice, food, hospital equipment and other impedimenta. Companies, A, B, C and D, constituting the first battalion, were moved in two days, the two other battalions taking similar lengths of time.

All the tents had wooden flooring. The officers' tents were lifted as they stood, flooring and all, without the disturbance of a cot or a case of books, loaded upon the truck, and taken one at a time to their new destinations. The tents of the enlisted men were dismantled, the floors of six or seven were loaded upon a single truck and rattled away.

The machine gun company of the regiment had four Fords. Its four rapid-fire guns were loaded upon these and hurried away. The distance from the old camp to the new one was in this instance four and one-half miles.

Back of the Lines

Back of the lines in time of war there is a constant forwarding of supplies of all kinds. Different roads are used by mule vehicles and automobiles; the former could never keep out of the way of the latter. Some roads are exclusively one-way routes, either for loads going to the front or for empty trucks returning.

Troops are rushed to the front, or to some threatened point, by truck, arriving at their destination sooner than if they had marched, and with their vigor left for the combat instead of wasting it on the road. A trial emergency call for reinforcements was recently sent to Buffalo from Fort Niagara, a post of the United States army, 33 miles from Buffalo.

The summons was telephoned to the armory of the 74th New York infantry and to the offices of the Pierce Motor Co. The call was received a few minutes before 12 o'clock noon, and at 12.50 o'clock nine 5-ton trucks sent from the factory had been loaded at the armory with 180 men, 3000 rounds of ball ammunition, kitchen and camp equipment and supplies, and the convoy started.

A speed of fifteen miles an hour was attained at times, yet each truck kept within twenty feet of the one ahead, and at 4 o'clock the soldiers and their supplies were at Fort Niagara, the men ready for business. This is said to be exactly the kind of work that is being done behind the respective fronts in the European war.

Although armored cars are in use in Europe, it is said by a representative of an American truck manufacturing company which has met European specifications for cars for use in the war zone, that 90 per cent. of the trucks in use there have platform or box body and tarpaulin covering, though there are times and places where tank and dump bodies would be convenient. Most of the trucking in the war zone is said to be done at night, the cars for the most part remaining parked during the day.

The Truck as a Gift

Several persons in Buffalo contributed toward a 5-ton truck for the 74th regiment last year, and this vehicle was of use to the regiment both before going to camp and while there. The truck took several loads of baggage to the train and was then loaded upon a flat car and sent with the regiment to the border, where it was constantly in use hauling ice, meats, water, lumber and other supplies which would have been infinitely longer on the way if the men had had to depend on the army mules or on the truck companies. The regimental truck even took a load of men to town on Christmas eve for midnight mass.

The 65th infantry, which was transformed while away from home into the third heavy field artillery, had no truck, and while at Camp Whitman, N. Y., was extremely envious of regiments whose friends had provided trucks for them. Indeed, upon the arrival of these Buffalo men at Camp Whitman, they were impressed with the inconvenience of not having a truck. Their tents and accessories were not brought up from the train immediately and the men worked about in the rain for two hours. A regiment which arrived in the same downpour had a motor truck and gots its tents on the scene promptly, having shelter almost upon its arrival at camp. All the regiments had to go to a single spring for water while at Camp Whitman. The Third artilley attached ropes to a wagon and drew the vehicle to the spring, where they loaded up with a barrel of water and laboriously and slowly returned. The Tenth regiment of Albany, which was also in camp, had a motor truck, and when the water was needed for the Tenth, the men flung in half a dozen cans, climbed aboard, and made a joyride of the errand.

The Third artillery labored under the same handicap on the border, but its turn came when it reached home. The horses which drew its guns were shod for work on the soft Texas turf and sand, and the Colonel decided that they could not stand a long parade on paved streets, so the guns of the Third artillery were drawn between rows of admiring spectators by Pierce-Arrow trucks on test.

Troop I's Trucks

Troop I, of the First New York cavalry, had a truck of its own before it was called out, and its driver was in the employ of the manufacturer. This truck was in almost constant use, and, being at the service of only 100 men, was able to do justice to their every demand. This truck has a standard 5-ton chassis with a low ratio worm gear, has no radiator protector and is fitted with a typical army type of body, which makes it practically invisible at a distance.

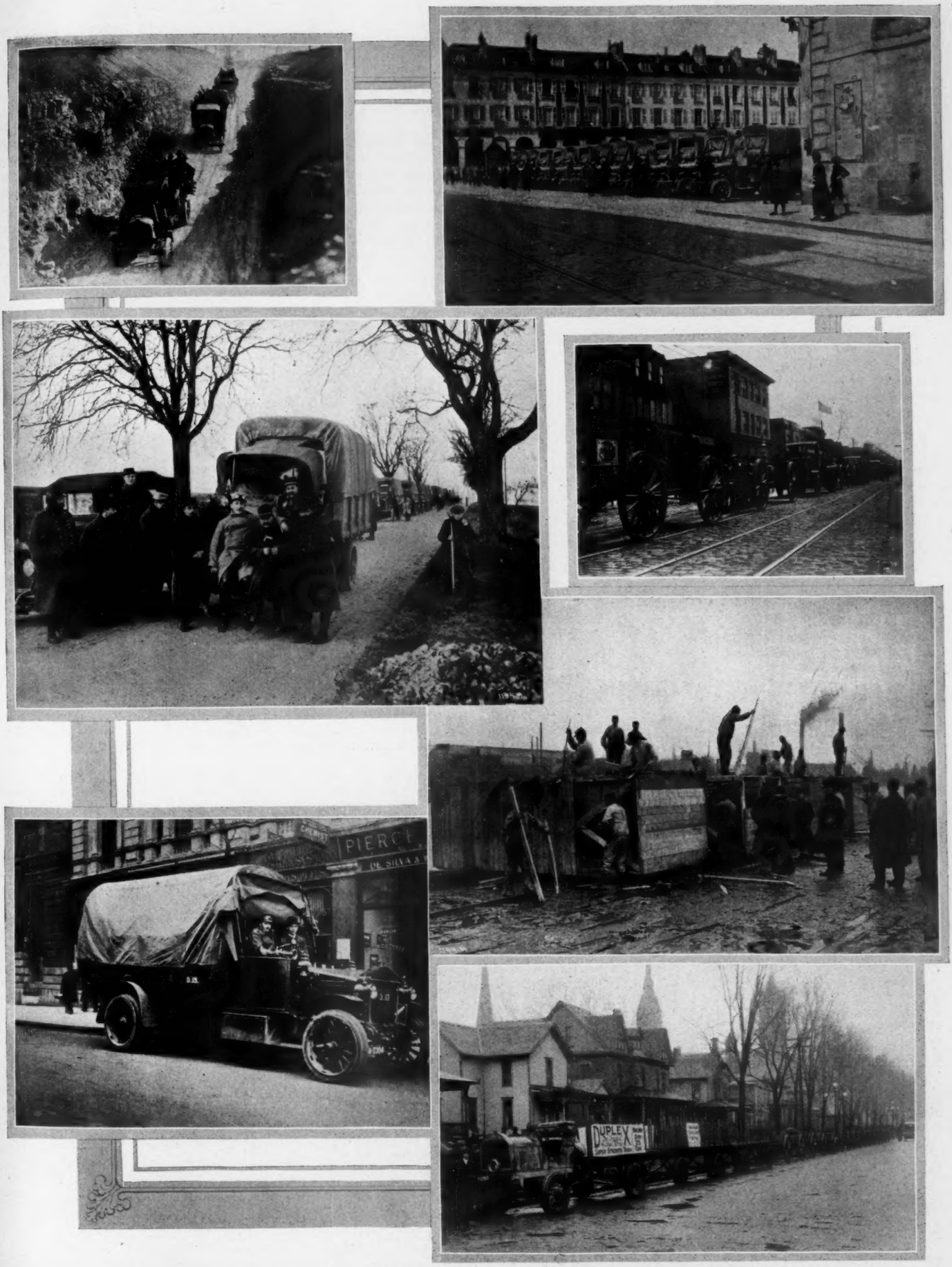
The body is 12 ft. 6 in. long and 6 ft. 6 in. wide. The sides are 2 ft. 6 in. high. The truck has a prairie-schooner top made of waterproof canvas. A large shelf beneath the body overhang affords storage space for extra cans of gasoline.

An extra magneto was bought with the truck, and two heavy stringers, 14 ft. long, 12 in. wide and 3 in. thick, were taken for emergencies, such as repairing or strengthening bridges.

The truck was unloaded from its flat car in Texas mud 10 in. deep, and at the command of the officers was loaded to capacity. It would not budge. Four army mules were attached, but still the truck stuck fast. Half the load was then removed, and the truck proceeded without difficulty over, or through, roads hubdeep in mud. An average day thereafter was 23 miles, practically all on second speed because of the condition of the roads. The truck carried 70 and 75 bales of hay at a load, while a team of four mules carried only 35 and were a good deal more bother. One record taken was of 403 miles on 131 gal. of gasoline.

THE SOCIETY OF AUTOMOTIVE ENGINEERS has opened an office in the Munsey Bldg., Washington, in connection with the Council of National Defense. The Society is well pleased with the results of its co-operation with the quartermaster's department as shown by the specifications of the 1½- and 3-ton military trucks given out recently. The Truck Standards Division of the Standards Committee has assisted the Quartermaster's staff in revising these specifications. It is possible that the Society will assist in aviation standardization work and also in the training of mechanics for aviators as well as in training and supplying mechanics for many other parts of war service. General Manager Coker F. Clarkson, or his assistant, Herbert Chase, will probably represent the Society almost continually in the Washington office.

"A little knowledge is a dangerous thing." The CCJ keeps you fully posted



Scenes Picturing the Use of Trucks in War Service on European and American Soil

In the upper left-hand illustration is shown a detachment of National Guardsmen answering a hurry call to Fort Niagara; at the bottom is shown a Duplex truck hauling three trailers, weighing two ton each, and sixteen munition caissons weighing 1875 lbs. each. This made a total load of approximately twenty tons

All phases of the truck industry covered best in the CCJ

The Motor Truck—A Burden Bearer For the God of War

By WARREN EUGENE CRANE

WITH a state of war existing between the United States and Germany, it becomes one of the nation's biggest problems to mobilize its military resources as quickly and efficiently as possible. There have been several motor trucks in the service of the quartermaster and various divisions of the army in the Northwest, which were ample for the needs of a time of peace, but upon the declaration of war an urgent call was issued to the various pleasure and commercial car agencies for machines to be used in recruiting, as well as the transportation of supplies and troops to the government training camp, which is located forty-nine miles from Seattle, at American Lake.

The Seattle branch of the Garford Motor Truck Co. offered the services of one of its trucks, which was needed by a group of Seattle dentists who had volunteered to go to the American Lake training camp to give free treatment to the national guardsmen and recruits. Chairs and other dental supplies were taken to the camp in a Garford truck. Not only was the transportation provided, but a service expert was sent with the truck, and when the dentists offered to pay for his services they were told that they were also donated. One of the accompanying illustrations shows the truck loaded with supplies and ready for the journey to the camp. When the dentists and oral surgeons had completed their work in the "Palace of Torture," as the tent was called by the soldiers, the chairs and equipment were brought back to Seattle in a two-ton G. M. C. truck.

The Government has recently purchased five trucks to be used for ambulance and Red Cross service in the Far East. The machines were shipped on the transport "Sheridan" and were bound for the Philippine Islands. Several trucks have been placed in the service of the United States Army Signal Corps. They have a wireless apparatus attached to the rear of them and are being used for various branches of the military messenger service with success.

H. E. Schmidt, manager of the Seattle branch of the Kelly-Springfield Motor Truck Co., offered the services of a Kelly-Springfield truck to the military authorities for the transportation of national guardsmen and equipment to American Lake. When the machine left Seattle it was well loaded with soldiers and supplies.

Several trucks have been shipped to Russia, where they are to be used in the service of the Red Cross in that country. The team of horses is becoming a thing of the past in this line of work as well as in other branches of military service.

H. H. Harwood, manager of the commercial car department of the Northwest Buick Co., of Seattle, placed a G. M. C. truck at the disposal of the Government when the call came for them during the mobilization of the National Guard. The truck that was placed in the service of the army was used to carry guardsmen and supplies from Seattle to the American Lake mobilization camp. This company recently sold the Government a G. M. C. truck, which is in the service of the Quartermaster's office and is employed in transporting provisions to Fort Lawton and other military stations surrounding Seattle.

The motor truck is rapidly succeeding the horse and mule as a burden bearer for the God of War because it is faster, stronger and unlikely to become frightened and unmanageable in the turmoil of battle.

Truck Contributed by Garford Branch to Carry Dental Supplies to Mobilization Camp at American Lake, Near Tacoma, Wash.

Kelly-Springfield Loaded With Soldiers Ready for Encampment at American Lake

MOTOR TRUCK CLUBS ENLIST DRIVERS

At a recent meeting of the Motor Truck Club in New York, Major S. P. Wetherill, Jr., of the United States Reserve Quartermasters' Corps, outlined a need for drivers for 40 motor truck companies, stating that the Army would need 1400 trained men at once. Members of the Club at once pledged themselves to be of service and help raise the necessary force of truck drivers with the least possible delay. Members of various clubs, societies and college men will be appealed to. These are to be drilled immediately, and when, as is expected a force is called for field service, those already enlisted will be fitted to go as truck sergeants in command of units.

DODGE BROS., Detroit, Mich., will bring out a small truck not exceeding 1000 lbs. capacity.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

Factory News

Corbitt Motor Truck Co., Henderson N. C., has increased its capitalization to $1,000,000. The output of trucks per year has been increased to 1500. The entire reorganization and refinancing was accomplished through Henry F. Vortkamp & Co., New York City.

Stegeman Motor Car Co., Milwaukee, Wis., has increased its capital from $100,000 to $200,000.

Union Motor Truck Co., Bay City, Mich., has increased its capital from $45,000 to $90,000.

American Motor Truck Co., Detroit, has purchased a factory building at Copeland Avenue and the Michigan Central tracks, in which will be manufactured 2, 3½ and 5-ton trucks. The new factory is 1½ stories high and has 40,000 sq. ft. of floor space.

Findlay Steel Castings Co., Findlay, O., has been capitalized at $200,000 by E. J. Edwards, president; E. G. Pelton, secretary, and Dr. C. H. Gage, chemist. The former home of the Grant Motor Co. has been purchased in which the new company will manufacture castings for automobiles.

Renno-Leslie Motor Co., Philadelphia, capitalized at $750,000 has been incorporated to manufacture automobiles and farm tractors. Incorporators: J. W. Hills, Jr., C. H. Reed and W. L. Connor.

Utility Tractor Co., Albany, N. Y., capitalized at $1,000,000, has been formed by J. F. Burke, Jr., and others, New York City.

Hale & Kilburn Co., Philadelphia, maker of automobile bodies and railroad equipment, is erecting an 8-story building at 6th & Filbert Streets, costing $500,000.

Famous Truck Mfg. Co., St. Joseph, Mich., has taken over the plant of the Deitch-Denton Co.

Oneida Motor Truck Co., Green Bay, Wis., recently organized to manufacture a line of motor trucks, has elected the following officers: F. E. Burrall, president; J. C. Fogarty, vice-president; J. P. Neugent, secretary and general manager, and Mitchell Joannes, treasurer.

Automatic Control Trailer Co., Columbus, O., has been incorporated with a preliminary capital of $25,000 to build trailers, and equip all trailers with an automatic tracking device, the patents for which are controlled by the company. Incorporators: H. C. Rogers, John H. Price, S. A. Kinnear, C. W. Seaman and John G. Price. A plant has been fitted up at the Broad Oak Garage.

Bell Motor Car Co., of York, Pa., manufacturer of pleasure and commercial cars, has been reorganized. The directors of the new company are: J. H. Myers, president; Jas. Adair, 1st vice-president; Dr. H. W. Posey, 2nd vice-president; Dr. B. F. Posey, treasurer, and H. M. Stauffer, secretary. The company has moved its offices from the main plant to other quarters half a block away, owing to lack of room. T. F. Freed is general engineer and Bevan P. Y. Jordan, director of sales.

Belmont Motors Corp., which is offering $500,000 7 per cent. cumulative convertible preferred stock at par, the par value being $10, has decided to settle in Lewistown, Pa. It has secured a plant where it will begin the manufacture of trucks. It is expected that from 15 to 20 trucks per day will be turned out. The directorate has not yet been completed. The present directors are to act during the organization of the company only. Final selection will be made by the stockholders.

United States Motor Truck Co., Cincinnati, O., has opened export offices at 1457 Broadway, New York City, in charge of C. W. Moody.

W. E. Seagrave & Co., Walkerville, Ont., Canada, prominent maker of fire apparatus, is bringing out an 8-cylinder truck to sell at $7,000. Beside the 8-cylinder engine, the truck is of standard construction. It is made only in 3½-ton capacity, although 2 and 5-ton sizes will also be built.

J. W. Murray Co., Detroit, manufacturer of sheet metal parts for automobiles, such as fenders, hoods, gasoline tanks, drip pans, etc., has closed negotiations for the acquisition of a factory with 100,000 sq. ft. of floor space in Cleveland. The new Ohio company is incorporated with an initial capital of $500,000. The Detroit plant and the Cleveland plant will work in close harmony, but will be financially separate.

Clark Equipment Co., Buchanan, Mich., is erecting a new wheel shop which will increase its present wheel capacity approximately 50 per cent. This new building will be 180 x 60 ft., and will be equipped with the most modern machines for the production of steel wheels for motor trucks. It is also adding additional equipment in its steel foundry to take care of its increasing machining capacity. When the new machinery is installed and the additional building completed, the company will be able to turn out approximately 100,000 wheels per day.

New Truck Agencies

Lee Abbott, Tulsa, Okla., has taken the ageny for the Indiana truck.

Avalon Garage, 231 Northeast Boulevard, Philadelphia, Pa., has taken the agency for Sullivan truck.

Robert M. Bartram, 2132 Market Street, Philadelphia, Pa.. has taken the agency for the Hurlburt truck.

Britton-Ransom Motors Corp. has been formed, with headquarters at Brighton and Commonwealth Avenues, Boston, Mass., to handle the Bethlehem truck in Maine, New Hampshire, Massachusetts and Vermont.

Collier Motor Sales Co. is a new concern at 175-183 Pleasant Street, Boston, Mass., and will sell the Collier truck in New England.

George W. Depue, Parker, Kans., has secured the agency for the Republic truck.

F. Carelton Dole, manager of the Oldsmobile Co., of Worcester, Mass., has taken the agency for the Maxfer truck maker.

Ellsberry and Yingling, El Dorado, Kans., have taken the agency for Velie trucks.

Fiske Corp., 834a Main Street, Worcester, Mass., has taken the agency for the Vim truck.

Knight Motor Co., St. Louis, Mo., has taken the agency for the Corliss truck.

Leach-Frawley Motor Co., San Francisco, Cal., has taken the agency for the Smith Form-a-Truck.

Leon Nelson will be general manager of a company in Dallas, Tex., for the distribution of the Pullford truck attachment. The company will have its headquarters at 1909 Commerce Street.

New Jersey Motor Truck Sales Co., 575 Central Avenue, Newark, N. J., has taken the agency for the Indiana trucks.

Ohio Bethlehem Truck Sales Co., Cleveland, Ohio, has been incorporated with a capital stock of $50,000, to handle the Bethlehem trucks in Ohio. W. A. Fay is president of the new concern and T. J. Fay, with headquarters at 1970 East 59th Street, will be sales manager.

Removals and Trade Changes

Commercial Truckmobile Co. has moved its general offices to 1720 S. Michigan Ave., Chicago, Ill.

Brunk Mfg. Co., formerly located at 3510 St. Louis Ave., St. Louis, Mo., has moved to Marion, Ind., in order to be near the foundry making its castings.

Economy Motor Truck Co., New York City, distributor of the U. S. Motor Trucks, has combined its sales and service business. It is now housed in one building at 306-8 West 64th St.

Automobile Supply Mfg. Co., Brooklyn, N. Y., has been bought by the E. A. Laboratories, Inc., together with its good will, trade marks, patents and all trucks and unfilled orders on hand. The E. A. Laboratories will now be in an excellent position to accept all outstanding orders for Handphones, Newtone and Ford magneto horns, as well as a full line of A. E. horns and motor-driven warning signals.

Hartford Auto Parts Co., Hartford, Conn., has taken space in the N. Y., N. H. & H. R R. Bldg. This will give the company about 125,000 sq. ft., and will enable it to take care of its rapidly growing business.

Smith & Hemenway, Inc., 99 Chambers St., New York City, manufacturer of Red Devil Tools, has moved its executive offices to 130 Coit St., Irvington, N. J., where its factory is located. Only the sales office devoted to New York and export trade will be maintained in New York City, at 261 Broad way.

Timken-Detroit Axle Co. has moved its Chicago office to 1843 from 1335 People's Gas Bldg., Detroit.

Victor Die Casting Machine Co., formerly of Wayne, Mich., has moved its office and factory to Ypsilanti, and will now be better able than ever to take care of future orders for die casting machines.

Friestedt Rim Contractor Co., Chicago, Ill., maker of the Friestedt Hydronizer, has changed its name to the Friestedt Mfg. Co. This change in the name is in keeping with the enlarged scope of manufacturing operations which have been undertaken since the original concern was organized several years ago to manufacture and market the Friestedt rim contractor. In the hydronizer, Arthur A. Friestedt, president of the company, has developed a device that is proving its remarkable worth as a combination gasoline economizer and means for removing and preventing carbon accumulations. Up to the present only hydronizers for Fords have been made, but the company will be supplying the device adapted for application to the engine of all makes of cars.

Forduplex Truck & Auto Co., of Detroit, has been taken over by the F. & X. Truck & Auto Co., of Adrian, Mich. This company, which was a branch of the Detroit Trailer Co., found larger quarters in Adrian and also capital to replace that invested by Stephen A. Griggs, of the Detroit Trailer Co. The Adrian investors appointed a committee late in March to take over the business, and to organize the company, of which committee Ladd J. Lewis, Jr., was appointed chairman, and Charles Wesley, secretary. Other members of the committee include Clarke E. Baldwin, S. W. Raymond, S. A. Griggs, H. A. Fee and E. E. Tobias. The Bond Steel Post Co.'s old plant has been purchased, and machinery and equipment is being bought. While the Adrian plant is being fitted out the manufacturing, assembling and sale of these trucks is being carried on at Detroit.

Merit wins—that's why the CCJ is the leader

Personal Items

Norman Bell, formerly sales engineer in the Automobile Division of the Lunkenheimer Co., Cincinnati, has joined the Norma Co. of America, New York City, in a similar capacity.

H. W. Bixler, who has been with the Republic Rubber Co. for six years, has been appointed manager of the foreign department, with offices in the Singer Bldg., New York City. He was transferred to New York in 1914 in charge of the eastern railroad sales department.

Chas. H. Burman has resigned active management of the Oakland, Cal., branch of the H. O. Harrison Co., of San Francisco, to take the agency for Republic trucks and Peerless cars for Alameda and Contra Costa Counties, and considerable other territory. He will make his headquarters at the factory.

J. P. Burris has joined the sales organization of the Diamond T Motor Car Co., Chicago, Ill. He comes from the Packard Motor Car Co., of New York, where he handled most of the large national accounts. He will have the same duties with the Diamond T Co.

Carl Burton, formerly connected with the Packard Motor Car Co., in Kansas City, has been placed in charge of material for the Diamond T Motor Truck Co., of Chicago.

H. P. Coimbra, representing the Cosmopolitan Commercial Co., New York City, has sailed for Brazil, Uruguay and Argentina. He will promote the sales of cars which his company represents for exporting, and investigate the opportunities in southern American markets for the American automobile industry.

Richard Everett, who was formerly sales manager of the Raybestos Co., Bridgeport, Conn., has joined the sales force of the Standard Woven Fabric Co., Walpole, Mass., where he will have charge of the jobbing business in Multibestos brake linings and other products manufactured for the automobile trade.

Wm. J. Kelly has been appointed field salesman for the Master Trucks Corp., Chicago.

Wm. Bilderback, who resigned as Ford salesman recently, has been appointed distributing manager for the Courtney-Dubuque Motor Co., Dubuque, Ia., and is selling the Smith-Form-A-Truck.

G. A. Gibson has become production manager of the Diamond T Motor Car Co., of Chicago. He has had wide experience in the truck field, having been connected with the Packard, White and G. M. C. Cos. He comes to the Diamond T from Kansas City, where he had charge of the motor truck division of the Packard Co.

Roy D. Heartz, formerly sales promotion manager of the Hupp Motor Car Co., and later assistant sales manager of the Premier Motor Corp., Indianapolis, has become assistant sales and advertising manager of the Moreland Motor Truck Co., Los Angeles, Cal.

J. W. Kelly, superintendent of the Ross Gear & Tool Co., Lafayette, Ind., has resigned. E. L. Usner has become assistant manager; J. P. McParland, superintendent of machine shops, and M. C. Griswold, superintendent of assembly.

Frederick S. Lawrie has resigned his position as sales manager of the Spacke Machine & Tool Co., Indianapolis, in order to devote his entire time and attention to his brokerage sales business, at 910 Merchants Bank Bldg. He is representing the following concerns: Spacke Machine Tool Co., Indianapolis, special auto machine parts; Metal Specialty Co., Cincinnati, O., light steel stampings; Transue & Williams Steel Forge Co., Alliance, O., heavy steel stampings, and Western Auto Machine Screw Co., Elyria, O., standard and special screw machine parts.

A. W. Menhall, of Edgerton, Wis., has recently taken over the plant of the Edgerton Wagon Co. for the purpose of manufacturing 2 and 4-wheel trailers. In connection with the corporation plans there is a stock issue of $185,000.

Walter F. Schmitt, formerly field representative, has been appointed district manager of the territory west of the Mississippi, and including Cincinnati and Memphis, for the Packard Motor Car Co., of Detroit. His territory will not include that of Mr. Morton, on the Pacific coast. O. E. Brown has been appointed district manager for the territory east of the Mississippi, with the exception of Cincinnati and Memphis for the Packard Motor Car Co. He will make his headquarters at the factory.

W. F. Sheehan is now general manager of the Globe Motor Truck Co., St. Louis, Mo., and H. C. Bain is general sales manager. Messrs. Eddy and Woodward have resigned.

E. G. Soward, for many years connected with the Thomas B. Jeffery Co., Kenosha, Wis., as pleasure car sales manager, and who occupied the same position when the company was taken over by the Nash Motors Co., has resigned to go into business for himself. His plans will be announced later.

Harry C. Stutz, president of the Stutz Motor Car Co., Indianapolis, Ind., has tendered six Stutz chassis to the Indiana National Guard, and has offered to assist in recruiting 30 first-aid men to accompany the cars. The Parry Mfg. Co. has promised to build the bodies.

F. A. Trinkle has been appointed field service manager for the United States Motor Truck Co., Cincinnati, O. He was associated with one of the most prominent truck concerns in the country for the past four years.

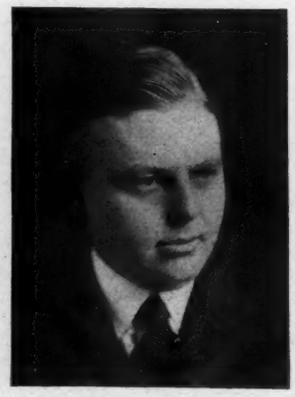
Elmer F. Twyman has been elected vice-president, treasurer and general manager of sales for the entire territory (12 states) of the R. E. Taylor Corp., sole eastern distributor of the Gramm-Bernstein. He has been manager of the Boston office for the past two years.

Dawson Blackmore has become director of sales for the O. Armleder Co., Cincinnati, O. He has had long experience as a business executive in charge of sales. The Armleder Co. reports that 100 per cent. increase in production has been absorbed by sales during the past few months.

H. H. Doering has become sales manager for the Baker R. & L. Co., Cleveland, O. For the past three years he has been manager of the Philadelphia branch of the company, and previous to that was connected with the Ohio Electric Car Co., Toledo, O.

Harry L. Loop, Jr., former Philadelphia branch manager of the Chase Motor Truck Co., has resigned that position and is now connected with the Rands Auto Co., 1805-7 Market Street, Philadelphia, distributor of the Selden trucks of from ¾ to 5-ton capacity.

J. D. Vail, former manager of the Salt Lake City office of H. W. Johns-Manville Co., has been appointed manager of the building materials department of that company's branch at Chicago. In the future the Salt Lake City office will be under the management of C. F. Cate. The Great Falls, Montana, office will be managed independently of Salt Lake City by J. H. Roe.



GEO. A. RICHARDS

Special representative for the Firestone Tire & Rubber Company's sales department in the Detroit territory. He has been connected with the sales department for seven years.

R. E. CHAMBERLAIN

Formerly connected with the Packard Motor Car Company, New York City, has been appointed to the management of the truck sales department at the factory.

W. G. E. BIRKETT

Has become advertising manager of the Standard-Detroit Tractor Company, Detroit, Mich., manufacturer of the Trackford plowing attachment for Fords.

R. G. SHUERT

New factory manager for the Acason Motor Truck Company, Detroit. He was formerly connected with the Indiana Truck Company, Marion, Ind., as production engineer.

The CCJ is built upon the lasting foundation of honest circulation

S. A. E. SUMMER MEETING TO BE HELD IN WASHINGTON

Because of war conditions, the summer meeting of the Society of Automotive Engineers, scheduled to be held the last week in June at Ottawa Beach, Lake Michigan, was called off by the Council of the Society at a meeting held a few days ago in Chicago. An extensive canvass of many connected closely with the activities of the Society showed a general feeling that few of the members could spare four days for such a meeting, particularly as each day finds the engineers more and more engrossed in war activities. Instead it has been decided to have a two-day summer meeting and hold it in Washington, D. C., on June 25 and 26. Washington was selected because many Government departments are closely associated with the work of the Society. Although the broad program of former years will not be attempted at this meeting, the activities of the Society have not been reduced, for there will be several smaller and more specific meetings

The tractor engineers, which recently amalgamated with the S. A. E., are confronted with one of the largest problems of the day—the conservation of our agricultural resources and more intensified agriculture. It has been known for a long time that tractor farming means amazingly more than the mere substitution of motor power for animal power. The winter wheat crop situation is a national example of the economic advantage of tractor farming over animal farming. For best winter wheat crops in Kansas, for example, the plowing must be done in July. With horses this month is too hot, and often the ground is too hard. With tractors the heat is no factor. Statistics extending over many years prove the value by increased yield per acre of tractor farming.

This situation has brought the tractor to international importance and the present demand for increased yield from our farms means perhaps a Government demand for greatly increased tractor production. The lack of standardization in the tractor field as compared with the motor car and motor truck field makes such impossible for a time. The Society faces this problem and its first work in the form of a special meeting will be to get the tractor makers and the Government agricultural interests working together more closely. It is expected that in the near future a meeting to this end will be held; such meetings will probably take place during the coming summer.

The summer meeting of the Standards Committee in Cleveland on May 3 will take on greatly increased importance this year. Besides the 140 men on the various divisions of the Standards Committee under the direction of Chairman Jo[illegible]tz, a call will be made to the meeting at large of the Society to attend, since the work of standardization is of greatevaninportance in these days of demand prodeerion.

It is possible that a special meeting will be required by the new branch of marine engineering recently amalgamated with the Society and representing motor boat work, such as submarine chasers.

RUSSIAN-AMERICAN EXCHANGE ESTABLISHED

In order to bring about a new state of conditions in regard to the American supply and the Russian demand for American goods, the Russo-American Merchants' & Manufacturers' Exchange, Inc., has been established. While several attempts have been made, and are at present being made, to create an industrial understanding between America and Russia, no attempt on a large scale has heretofore been made to make the American manufacturer see his opportunity and the Russian consumer understand his advantage, since all such efforts have been characterized by the endeavors of a single group of manufacturers trying to reach isolated groups of consumers. A campaign will be instituted among Russian consumers, one of the phases of which will be a comprehensive directory of American industries, including all American manufacturers in any given branch of industry, and which will be distributed throughout Russia to the number of 40,000 copies.

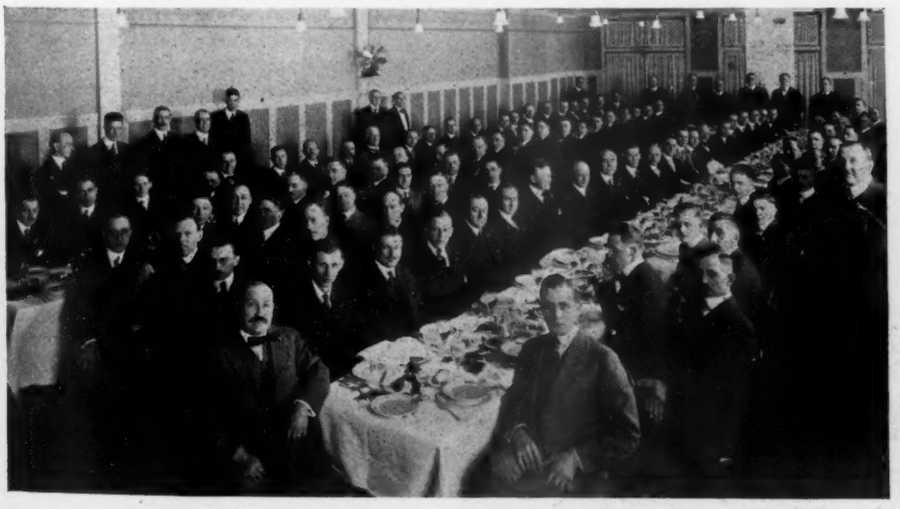
AUTOMOBILE INDUSTRY TO HELP PRODUCE FOOD SUPPLY

Since the daily press and the trade papers have been advocating need for greater vegetable crops, many of the automobile factories have taken the matter up with their employes and have offered the unoccupied ground adjacent to their factories for this purpose.

The Goodyear Tire & Rubber Co. is already getting into intensive agriculture, in addition to its many other activities. Every foot of ground the Company owns and that is not needed immediately for building purposes will be placed under cultivation at once. Over one hundred acres can be cultivated immediately and any additional land needed can be quickly cleared.

The principal crops will be potatoes, navy beans, wheat, corn, peas, etc. Bunk houses will be erected at the lake to house the men at work on the farm. The work will be in charge of the Labor Department. C. W. Nash, president of The Nash Motors, has offered a great vacant plot of ground belonging to the company, and as much other land as is necessary to fill the applications. This will be plowed and harrowed at the company's expense, then divided into garden plots and apportioned free to each employe who will agree to plant and care for a garden this summer.

Harvey S. Firestone, president of the Firestone Co., has announced that 50 acres of land south of the factory will be divided into quarter-acre plots for factory employes to cultivate. There will be 200 truck gardens, and these will be assigned to the men in order of application.



The Annual Dinner of the Mid-West Section, Tendered to President Dunham and the Council of the Society of Automotive Engineers

Over 150 motor car, truck, tractor and oil engineers attended the annual Mid-West S. A. E. dinner at the Chicago Automobile Club, on April 16th. President Dunham's speech was along patriotic lines, he laying stress particularly on the fact that through the Society the Government is planning to utilize S. A. E. members, and that they would best serve their country by waiting the call through the Society rather than in a burst of patriotism centering their efforts in some particular line of service in which they would not be as useful as in that which is being planned for them.

TEXAS ACCESSORY JOBBERS FORM AUXILIARY TO THE NATIONAL ASSOCIATION

Members of the National Association of Automobile Accessory Jobbers of Texas held a meeting at the offices of the Fisk Co., of Texas, March 7 and 8, and formed an auxiliary organization to the national association.

About fifteen members were present of which about eleven were visitors from other cities in the State.

It was a get-together meeting and several things were discussed for closer co-operation with the retailer. In the future meetings will be held often and it is believed much good can be done in bettering local trade conditions.

The following officers were elected: G. W. Hawkins, of Houston, president; O. E. Dunlap, Jr., of Dallas, vice-president, and E. E. Rhoads, of the Fisk Co., of Texas, secretary and treasurer.

Make your product pay—advertise in the CCJ

ARMY SPECIFICATIONS MADE KNOWN

Now that the Government has made it known that it will not be necessary to commandeer commercial cars, except in a case of extreme or unforeseen emergency, much anxiety has been relieved. Since the Government will obtain its trucks direct from the manufacturers, much interest has been centered in the specifications that have been drawn up by the Quartermaster's Office under the direction of the Society of Automotive Engineers. At the present time the Government has 2600 trucks in running order, most of which have seen service in Mexico. The needs of the Government will grow so gradually as to permit the industry to supply its requirements without interfering seriously with regular commercial operations for the present. A census of the truck manufacturing companies shows that a moment's notice the makers are prepared to furnish 300 complete trucks per day. Quite a few of the large companies have a number of trucks on hand, which have been held up due to the freight situation.

The War Department expressly states that it is not intended that this year's specifications shall limit either the War Department or truck manufacturers to the production of trucks that meet in all particulars the requirements of these specifications. On the contrary, it is expected that trucks manufactured for military service will depart more or less from these specifications, depending upon the equipment of manufacturers and their facilities for varying their production to meet, where practicable, the major requirements of these specifications.

The specifications which are considered of vital importance are the following: The engine must be four cylinders, with a piston displacement of 312 cu. in.; four speed transmission with lowest gear ratio 40:1; the engine must be three-point suspended; the radiator requirements call for a cover about twice the normal size; gasoline tank must have a capacity of not less than 30 gals.; trucks must be provided with electric lighting and starting system and dual ignition system; tires must be demountable. Particular stress is laid on interchangeability and tests. Analysis of materials for important parts such as springs, drive shafts and gears are required.

Specifications call for 1½ and 3-ton sizes. Manufacturers are required to meet a year's guarantee not only on the truck itself, but also on the parts and accessories no matter who manufactures them, and to pay transportation charges on parts returned. The specifications of the 1½-ton truck call for a load capacity of 4775 lb., which includes weight of body, supplies and crew. The weight of the chassis, without body or equipment, is limited to 6000 lb. Unit power plant construction is not permitted. The engine and gearset must each be 3-point suspended. The crankcase must be horizontally divided. The carburetor must be heated and must be made without aluminum and must be fitted with a dust collector. Electric slight equipment is required and a 10½ Co searchlight is one of the items in the long list of requirements. Dual ignition system is specified, and high tension magneto and a battery cooling system as an alternative. Drawings and data must be submitted on all trucks purchased.

Truck manufacturers can obtain copies of these specifications from the Quartermaster General, War Department, Washington, D. C.

ELECTRICAL TRANSPORTATION FOR EXPLOSIVES

Manufacturers of electric commercial cars are calling particular attention at this time to the use of the "electric" for transporting explosives. A truck for this purpose must be as nearly fire-proof and collision-proof as is possible to make it.

To meet the strict specifications the body of the truck must be very carefully constructed—a heavy steel frame entirely lined with wood in such a way that absolutely no metal is exposed; then all parts thoroughly covered with fire-proof lining, including every wire and even the control. Special designed shock absorbers and patent bumpers are attached, and four fire extinguishers must be carried for any emergency.

A number of electric trucks are being used by a large manufacturer of explosives and have been accepted by the Bureau of Combustibles of the New York Fire Department as the safest means of transporting explosives through the city streets.

Motor Trucks Used to Guard Industrial Plant

Since this country has been placed on a war basis, many industrial plants have taken precautionary measures and are guarding their properties. The illustration shows the guard which is patrolling the plant of the United States Motor Truck Company, of Covington, Ky. Everyone entering the railroad yards is forced to present a passport and the credentials are closely scrutinized before the holders of them are allowed within.

AUTOMOTIVE ENGINEERS WORK WITH GOVERNMENT

Military Trucks Standardized

No organization in the country contains in proportion more men qualified to act in governmental co-operation in a technical and executive way than the Society of Automotive Engineers as a result of the combination, April 19, with the Society of Automobile Engineers of the members of the American Society of Aeronautic Engineers, the Society of Tractor Engineers, and engineers of company members of the National Association of Engine and Boat Manufacturers. The society has been classifying its membership as to capability for government service industrially or with the troops. Over two thousand of the members have filled out blanks indicating their experience in designing and producing engines and other parts for airplanes, motor trucks, watercraft of various types, tractors and munitions. Three or more grades of men have been classified according to the following callings: Chief engineers, assistant engineers, draftsmen, electrical engineers, superintendents, metallurgists, inspectors, apparatus testers, laboratory engineers, truck masters, purchasing agents, service men, tool designers, executives, chemists and fuel and lubricant engineers. Trained in the highest speed industry the world has ever known, to get results without precedent as to equipment, material or time available and to assume large responsibilities, the members of the S. A. E. are well qualified to solve any automotive problems on which the government may desire assistance. They are quite ready and willing to do anything that will assist the United States, serving in any capacity in which their country may see fit to use them at any time.

Credit Due Truck-Standards Division

The Truck Standards Division of the society, of which H. D. Church is chairman, and many leading truck designers are members, has done monumental work in the formulation and revising of specifications for military trucks so vital to transportation of troops and supplies, supplementing railroad facilities. Tens of thousands of trucks will be needed for the armies now being organized in this country. The Army Divisions have been thoroughly motorized, regimental transport mediums alone remaining animal-drawn. The United States has done more than any other country to standardize motor trucks. In the specifications issued by the government, the most important ones of which are given under a separate heading in this issue, the features of construction that are vitally important have been given due effect. The Quartermaster and other corps of the War Department deserve great credit for this result. The work of the automobile engineers in this connection is probably of the most epoch-making nature of anything they have done since the establishment of the fine-pitch screw and bolt standard ten years ago.

For its readers—information; for its advertisers—results. That's the purpose of the CCJ

Activities of the Motor Truck Association of Philadelphia

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War Shows Need of Perfect Roads

Motor Truck Association Back of Good Roads Movement in Eastern Pennsylvania

The vital necessity of preparing our State roads for heavy war-time traffic and the urgency of putting them in condition at the present time was discussed by W. R. D. Hall at a dinner of the Motor Truck Association of Philadelphia held Wednesday night, April 18th, at the Hotel Adelphia.

Mr. Hall, who was formerly with the State Highway Department and who is now director of the Publicity Bureau of the Chamber of Commerce of this city, pointed out that the entire fifteen arterial routes leading into this city were in frightful condition. He said the majority of these were old pikes and will require much resurfacing to withstand the heavy traffic enacted by heavy motor trucks in times of war. "It is very important," said Mr. Hall, "that the citizens of Philadelphia and the various motor truck organizations recommend a compromise between the Buckman and Merkle Bills, which are now in the hands of the State Highway Department.

"Either one of these bills will aid in improving State highways and ultimately will result in extension of the motor truck business into outlying sections and counties of the State. We cannot place too much importance on the value of good roads to Pennsylvania during the present crisis, should the railroads become congested so that we would have to depend on State roads for transportation of our troops and supplies. In that event the highways in the present condition would not hold the heavy strain of heavy motor trucks.

"There is no such thing as a permanent State Highway. The only thing the State Highway Department can do is to spend money annually in the maintenance of these roads. Therefore, this is the time they should be kept in the best of condition for war-time traffic."

Lee J. Eastman, president of the Packard Motor Car Co., of Philadelphia, also chairman of the Good Roads Committee of the Chamber of Commerce, then explained the Buckman and Merkle bills, and the recent visit of his Committee to Harrisburg to discuss this bill with Governor Brumbaugh. Mr. Eastman advocated a compromise between these two measures. He stated the best thing for the Motor Truck Association to do would be to also recommend a compromise, which they did. Mr. Eastman explained how easy it has been under the present bill to obtain a license to drive a car in the State of Pennsylvania. He said the license privilege has been abused in some parts of the State, and he cited several instances to show where eight to ten members in the same family held individual licenses to drive one car. The speaker also told of cases where blind men and several incapacitated persons had obtained licenses to drive cars in the State. Under the Buckman bill the State Highway Commissioner would have authority to revoke such licenses after a thorough investigation on his part.

Trucks a Big Help in Mexico

Captain E. L. Morey, who became famous throughout the country after the battle of Carrizal between United States soldiers and Mexican bandits, and who is now an instructor in military training at the Pennsylvania Military Academy, explained how motor trucks had been a comfort to the United States soldiers, when they were in Mexico. He stated the roads were frightfully dusty in some parts of Mexico, and the lack of preparedness on the part of some motor companies had made it difficult for the truck drivers in their road work. He advocated that the truck companies should send expert men on these motor transportation expeditions, who would be in a position to direct the transportation of these motor vehicles.

Captain Morey also made a plea for universal military training and emphasized the importance of universal military training to put this nation in a state of sound preparedness. "It certainly would change the attitude of our citizens and also would change the attitude of immigrants toward the United States Government. We need not fear for a moment that universal military training would develop a militaristic government; as a matter of fact, I believe universal military training would develop better manhood, so that the soldiers when they are mustered out of service would be better citizens, mentally and physically."

Mr. Hall also explained that there had been a gross infringement on the present law, and that some persons had even been found guilty of hiring their tags out for a day. He cited one case where they had been hired out for an undertaker's hearse by the day. Under both new bills the minimum fee for owners' license tags would be $10; for dealers' tags the fee would be $15.

Other speakers included S. V. Norton, truck tire sales manager of the Goodrich Tire & Rubber Co., of Akron, O., who spoke on "How to Secure the Co-operation of Motor Truck Drivers."

After again driving home the methods employed by truck owners generally, Mr. Norton said, "The most effective means of securing the driver's co-operation is to offer him some reward for his good work. At first thought the idea of a bonus for the truck driver is apt to be distasteful to the average American employer. It savors too much of a tip. The driver is hired to do good work, not bad, and his wages ought to be sufficient.

"Such sentiments are creditable, but not especially sound. The truck owner must

S. V. NORTON

realize that the driver is doing nine-tenths of his work away from his supervising eye. The driver is, moreover, engaged in work which is admittedly difficult and calls for the exercise of vigilance, judgment and restraint, qualities which the worker does not pour into his labor for daily wages. While the very life of the expensive motor truck is dependent upon the care of the driver, there is no owner who would place this responsibility upon him if it could be avoided.

"Truck owners should see the problem as it is. Though it cannot be completely solved, it can be attacked with considerable success. The reward is the trump card, for then the driver has some incentive to save your investment. Is it worth while to play

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

this little game with him for the amount at stake justifies it."

Benjamin C. Atlee, a Lancaster lawyer, made a plea for more loyalty in responding to the President's call for Americanism during the present crisis. He placed loyalty above patriotism.

Judge Norris Barratt, of Common Pleas Court; H. C. Adam, manager of the truck department of the Packard Motor Car Co., of New York City, and J. W. Bengough, of Toronto, were the other speakers.

A communication was read by the Secretary from H. M. Coale, captain of the winning membership team, in which he suggested that the money collected for the proposed dinner to be given by the losing team to the winning team, should be turned over to the American Red Cross, and as far as possible each member be made a member of the Red Cross on both teams, who are not already members of the Red Cross. Upon motion of J. P. Guyer, one of the captains, and seconded by J. B. Fowler, member of the winning team who brought in the largest number of new members, President Doolittle was instructed to use the funds that he had received for the dinner to establish membership in the Red Cross for each one of the winning teams who are not now members and for as many of the losing teams as the funds will permit. This was unanimously carried.

F. G. Browning, chairman of the Entertainment Committee, reported that they had secured Kugler's Mohican Club House on the Delaware for Saturday, June 16th, for the outing, and that an elaborate program had been arranged for.

THE ROAD-MAKER, formerly published at Moline, Ill., will hereafter be published by the International Trade Press, Inc., 515 Monadnock Block, Chicago. Joe L. Long, founder of the magazine, retains his interest and will continue to direct its policies as editor and manager. H. E. Hopkins is retained as managing editor. The International Trade Press also publishes Electrical Review, Cement World, International Trade and several annual publications.

FIRST TRAINLOAD OF TRUCKS LEAVES NASH FACTORY

All records for individual shipments of Jeffery trucks were broken by The Nash Motors Co., of Kenosha, Wis., this week, when a solid trainload, comprising 12 Jeffery Quads and 28 Jeffery All-Purpose trucks, 40 units in all, were dispatched to the H. Barcroft White Corporation, Nash distributors in Syracuse, N. Y.

Immediately upon the arrival of this trainload in Syracuse, these trucks will be turned over to the dealers of the H. Barcroft White dealers are located.

They will be driven in a long parade through the streets of Syracuse to the home of the H. Barcroft White Corporation. From there they will be dispatched to the different cities in which the H. Barcroft White dealers represent the Nash lines.

Because of the steadily increasing demand for Jeffery trucks, the factory has been forced to double its production schedule originally planned. Even now, with the manufacture proceeding on that basis, it is practically impossible to keep abreast of the orders.

TRACTOR DEMONSTRATION TO BE HELD IN FREMONT, NEB.

The Tractor Demonstration Committee of the National Association of Tractor & Thresher Manufacturers has decided to hold the annual tractor demonstration at Fremont, Neb., from August 6th to 10th inclusive. A. E. Hildebrand, of Bloomington, Ill., is manager. The committee spent several hours in looking over prospective plowing sites and it was found that approximately 3000 acres, mostly level, could be secured. Headquarters will be established about a mile from Fremont, a short distance from the Lincoln Highway. It is probable that the exhibits will be housed in a big tent, 90 ft. by 1500 or 2000 ft. Fremont will be better able to accommodate the crowds this year on account of the new Pathfinder Hotel, with 120 rooms, which is nearing completion.

Truck Brake Test

The accompanying illustration, revising the immortal "Footprints on the sands of time," shows tire prints on the slush of asphalt—the results of tests made with a U. S. "floating power plant" truck to demonstrate its non-skidding qualities. Side skidding is prevented by the brake-equalizer feature of the truck. By way of explanation, the truck, in three trials, was brought to a full stop on a street in Cincinnati, the first time, with a three and a half ton load, in nineteen feet; the second time, with a four and a half ton load, in eighteen feet; and the third time, empty, in twenty-four feet. An interesting phenomenon, which is vividly illustrated by the sets of marks on the right, is the fact that while empty the truck actually hopped along, on and off the pavement when the brakes were violently applied.

COLLIER TRUCK COMPANY SECURES ORDER FOR $12,000,000 WORTH OF TRUCKS

The Collier Motor Truck Co., Sandusky, O., has entered into a contract with a Cleveland concern for $12,000,000 worth of motor trucks. The contract calls for $2,000,000 worth of these trucks this year; 100 trucks to be turned out for May delivery, and later on, 500 will be delivered a month. This order will necessitate the erection of a new factory, and 100 more men will be added to the working force. The officers of the Collier Co. are: Martin E. Lerow, president; Scott H. Penfield, vice-president; W. H. Collier, secretary and treasurer, and John Crowe, general manager.

DIAMOND T MOTOR TRUCK COMPANY TO ERECT LARGE PLANT

The enormous plant of the Diamond T Motor Car Co., being erected at W. 26th St. & Kilbourne Ave., Chicago, Ill., will give the company the facilities it has needed for some time for the manufacture of motor trucks. The first buildings of the new plant cover only 125,000 sq. ft. of the 10 acres controlled by the company. The capital stock has been increased to $500,000 and the sales force has been entirely reorganized under the head of F. J. Pardee. G. A. Gibson is in charge of the production and sales departments, assisted by P. W. Herman, assembling superintendent. W. F. Bird has charge of the finishing department and Carl Burton charge of material and F. Lundgren is superintendent of the machine shop. D. W. Jones is chief engineer and H. C. Emberson is chief purchasing agent.

RUSSEL AXLE COMPANY BUYS GEAR PLANT

Russel Motor Axle Co., North Detroit, Mich., has increased its capital stock from $250,000 to $600,000, and declared a stock dividend of 100 per cent. The company has also purchased the gear plant of the Russel Wheel & Foundry Co., which has been virtually the Russel property, ownership of the two companies being nearly identical. By this purchase the axle company is assured of an adequate source of supply of differential and internal gears not only at once, but because of the large expansion of the gear plant that is to be made.

FORD WAIVES PATENT RIGHTS ON FARM TRACTORS

According to the daily press, Henry Ford, at the request of the British Government, has waived all patent rights on his farm tractor and has cabled his specifications to England so that Great Britain can manufacture tractors for use in the British Isles and in France. It is also announced that Mr. Ford hopes to have a great number of tractors ready for use in the United States and Canada by August 1st.

Advertising appropriations bring greatest returns when expended in the CCJ

Government Needs Truck Drivers

Army Requires 1360 Truck Drivers to Operate 40 Truck Trains. Clubs Assist in Recruiting

NOW that the machinery has been set into motion, which is to organize and equip the greater U. S. Army and Navy, orders have been issued from the War Department in Washington and transferred through Major Frank H. Lawton, Quartermaster Corps, Department of the East, to raise an army of 1360 truck drivers, truck masters and mechanics.

The Motor Truck Club of America has been called upon to undertake the work of obtaining the crews of forty motor truck trains for army work. These men are to be recruited into the Quartermaster Enlisted Reserve Corps and will enlist for a 4-year period with but 15 days' compulsory service yearly, if so ordered. They will not be called to active service for the Government until such time as an emergency arises. This may be at any moment now, in view of the training camps which have been established all over the country since May 1.

It is not the intention of the various committees to recruit drivers solely from the ranks of present-day drivers, as that procedure would seriously cripple the present industrial transportation life in the localities from which such men were taken. It is rather the intention to obtain enlistments from among the ranks of pleasure car chauffeurs, those who own or drive their own cars and from college graduates who could be made into drivers of the highest class after a short period of training.

As thirty-four drivers are to be recruited for each truck train, the total number to be secured will be 1360. While this number seems comparatively small and easy to obtain in the large territory of the Department of the East, stretching from Maine on the north and Alabama and Florida on the south, it will be but a drop in the bucket as compared to the number which will be required to transport materials and supplies for the first 500,000 increment of the new army which the Government plans to raise by conscription.

New York Committee

The New York Committee is composed of the following: George H. Pride, chairman; Emlen S. Hare, Thomas F. McCarthy, Joseph K. Orr, George H. Duck, Arthur J. Slade and Joseph Husson.

Examinations and enlistments are now being made in New York City at the offices of the Motor Truck Club, 1790 Broadway, where application blanks may be secured and where a United States army surgeon and recruiting officer are on hand to swear in any applicants who pass the test of the examining board and the physical test as given by the army surgeon.

The Philadelphia Committee

C. A. Musselman, chairman of the Philadelphia Committee, has formed a committee composed of the following members: Chas. A. Porter, Jr., Secretary; Samuel M. Clement, Jr., Robert P. Hooper, Stedman Bent, C. H. Bell and Wm. N. Morice. Recruiting work is being carried on in Philadelphia at the offices of the Automobile Club of Philadelphia, 23 S. 23rd Street. The Philadelphia Committee is forming sub-committees in the various towns throughout the State of Pennsylvania, New Jersey, Delaware, etc.

Boston is New England Headquarters

A similar committee has been formed in Boston to obtain recruits in the six New England States which will form the Northeastern Department. The personnel of that committee is as follows: Major Harry G. Chase, chairman; Lieut. P. C. Baker, E. J. Sampson, Day Baker, Cornelius Beard. Captain F. J. Burnham is secretary and executive officer.

Quartermaster Reserve Corps

Applicants for enlistment as truck drivers must be between the ages of 18 and 45. They must be citizens of the United States and be able to speak, read and write the English language. They must furnish two certificates of good moral character, with particular reference as to sobriety and as to experience, and in addition must take the technical and physical examination already referred to.

Truck drivers in the enlisted corps are recruited as sergeants at the rate of $36 a month, and will have their railroad fares to and from their homes paid by the Government while traveling. They will be supplied with uniforms the same as prescribed for enlisted men of the Quartermaster Corps of the regular army reserve, except for insignia. In addition to the above 1360 sergeants required as truck drivers, the Quartermaster's Corps, Department of the East, must also recruit the personnel for eighty wagon companies, seventy bakery companies and miscellaneous skilled workmen, bringing the total of the personnel required, including first sergeants, sergeants, cooks, corporals and first-class privates up to 5233 men.

BRITISH ORDER ONE HUNDRED AND FIFTY MACK TRUCKS

After inspection and careful tests, the British Government has ordered from the International Motor Co., one hundred and fifty 5½-ton Mack chasses of the "bull dog" type. These trucks are standard in every way. The ruggedness of their design, with massive front bumper and sloping hood, protecting vital engine parts and radiator, makes them particularly available for war service. In appearance these Macks, with their pugnacious front and resolute lines, suggest the tenacious quality of the British Bull Dog. In fact, these trucks have been dubbed "Bull Dog Macks" by the British engineers in charge.

LINCOLN HIGHWAY BECOMING A FREIGHT ARTERY FOR SHIPPERS

On account of the transportation difficulties which are making no end of trouble for shippers in Pittsburgh and consignees in the East, many shippers are taking advantage of the Lincoln Highway, which is rapidly becoming a freight artery. Wholesale merchants in Pittsburgh are making deliveries by truck direct to retailers on the Lincoln Highway and other roads.

MANLEY MOTOR CORP., Chicago, has announced the following list prices:

Model 30, 1½-ton	$1800
Model 50, 2½-ton	2250
Kerosene burning equipment	100
Electric starting and lighting	125
Electric starting only	75
Enclosed cab in place of seat	35

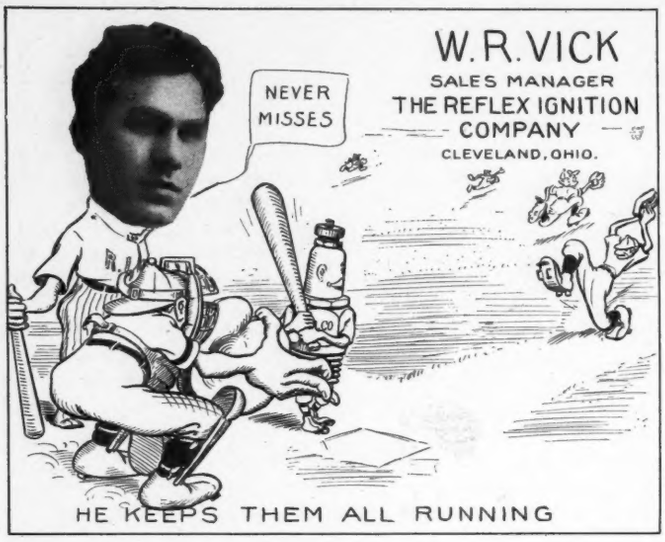
The offices have been moved from Chicago to the factory at Waukegan, Ill.

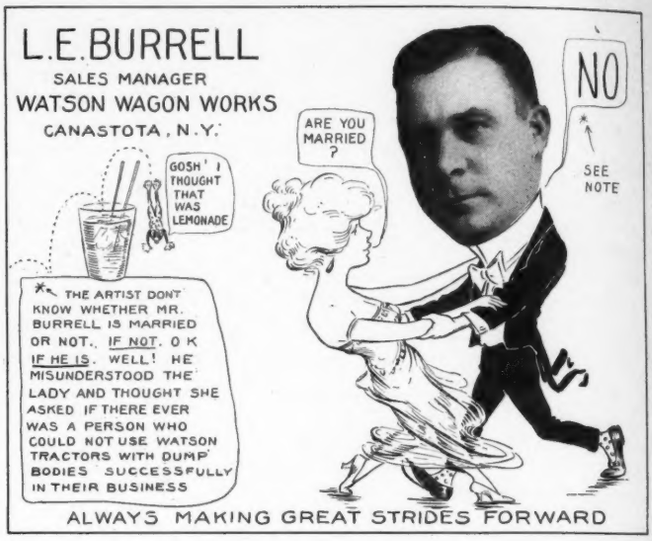
New Commercial Truckmobile Offices

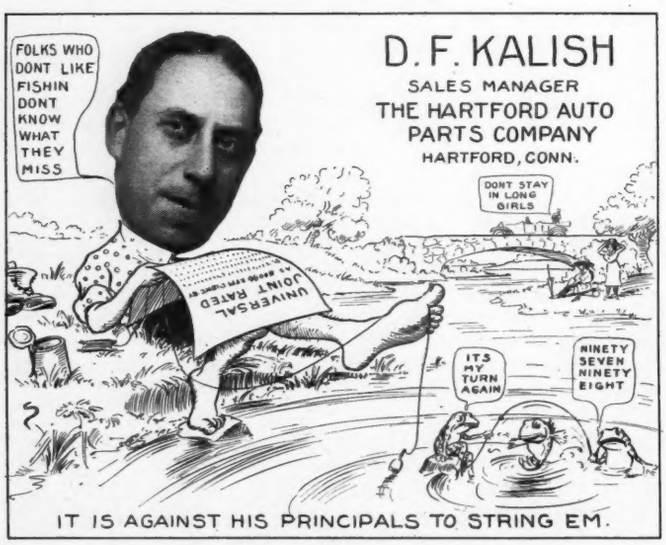
The Commercial Truckmobile Company, of Chicago, has moved into its new general offices, 1720 South Michigan Avenue. The transfer of quarters was made necessary by the tremendous increase in business. E. F. Kirchberger, president of the company, predicts the most successful year in the history of the truck-attachment industry despite the war.

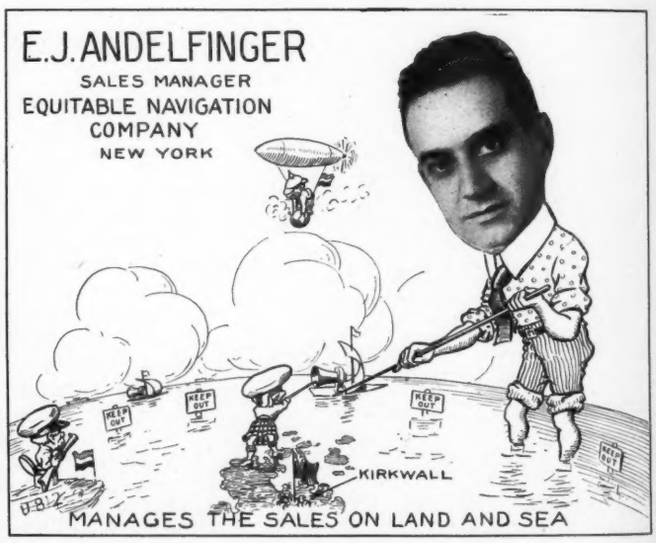
"An indication of the growing demand," says Mr. Kirchberger, "is shown in the fact that while we had set a certain figure as the limit of our production for this year, it has been necessary for us to provide for four times this number. The truck attachment idea has come to stay. From the standpoint of adaptability, economy and efficiency, the truck attachment in my opinion compares favorably with the standard factory-built trucks which cost many times as much. And the demand proves that the general public interested in transportation and hauling believes so, too."

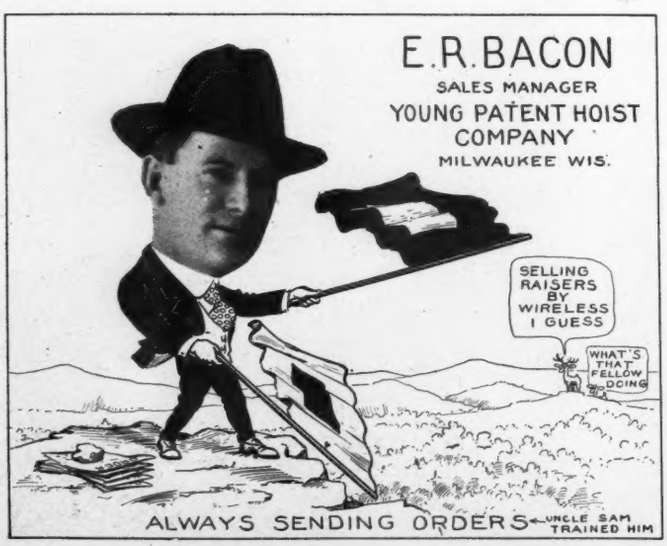
CCJ GALLERY of SALES MANAGERS




L.E.BURRELL
SALES MANAGER
WATSON WAGON WORKS
CANASTOTA, N.Y.
GOSH! I THOUGHT THAT WAS LEMONADE
THE ARTIST DONT KNOW WHETHER MR. BURRELL IS MARRIED OR NOT. IF NOT. O K IF HE IS. WELL! HE MISUNDERSTOOD THE LADY AND THOUGHT SHE ASKED IF THERE EVER WAS A PERSON WHO COULD NOT USE WATSON TRACTORS WITH DUMP BODIES SUCCESSFULLY IN THEIR BUSINESS
ARE YOU MARRIED ?
NO
SEE NOTE
ALWAYS MAKING GREAT STRIDES FORWARD


D.F.KALISH
SALES MANAGER
THE HARTFORD AUTO PARTS COMPANY
HARTFORD, CONN.
FOLKS WHO DONT LIKE FISHIN DONT KNOW WHAT THEY MISS
DONT STAY IN LONG GIRLS
UNIVERSAL JOINT RATED
ITS MY TURN AGAIN
NINETY SEVEN NINETY EIGHT
IT IS AGAINST HIS PRINCIPALS TO STRING EM.





The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

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TRUCKS AND THE WAR

TWO articles in this issue are deserving of particular attention for their connection with the subject which is uppermost in the minds of us all today. One shows the preparedness of the automotive industry to be of assistance in our international difficulties and the other what motor trucks are doing in the hands of the Allies.

The latter article, based on an interview with George P. Sweet, of the United Motors Co., who has just returned from France, is extremely interesting as being the account of an eye witness of how extraordinarily effective the motor truck has proved. In fact, Mr. Sweet goes so far as to say it is indispensable and it would truly seem so from his story. As is related in this article, engagements have been decided by the participation of trucks in the service of the army, bringing up ammunition, food and other supplies.

We had a little taste of what was possible in our Mexican experiment and showed ourselves able to quickly put in the hands of the army effective means for handling men and equipment.

There are already in the service of the Allies over 40,000 trucks and it is estimated that another year of the war, if it continues, will see the allied armies using 75,000 trucks, a somewhat staggering figure when we think that it is about a fifth of the total number of commercial cars in use in this country in all lines.

The builders of pleasure cars, motor trucks, motorcycles and tractors will all have their share to perform when this country sends an army abroad and the evidences are numerous that they are not only ready and willing but fully competent to do everything that may be required of them.

HAVE YOU A LITTLE GARDEN IN YOUR HOME?

AMUSING are some of the attempts that are being made to supply the table with fresh vegetables out of a "two-by-four" backyard plot. However, "every little bit helps" and there is no harm to come from the people, as a whole, getting back to nature and playing at farming. Anyhow it will benefit their health and if the occupation keeps their minds duly impressed with the necessity of conserving our food supply, wasting nothing and utilizing the numerous other articles of food that are not ordinarily in great demand, it will help in that great big problem which lies before this country in the next six months. Our most important crops are certain to fall short of normal and we are committed to share our diminished supply with our sister countries across the water.

For some reason or other certain people are heedless of the seriousness of this situation, reassuring themselves with the thought that the warnings which have appeared are mere newspaper talk. The fact of the matter is that the warnings have come from expert authorities and have not been printed for the sake of sensationalism.

More on this subject will be found on the Publishers' Page in this issue where attention is drawn to the fact that the main relief in sight is the tractor. What we would particularly comment on here is the disposition of the American people generally to accept every condition of life as a matter of course and take little concern over some of our deeper national problems. Perhaps, now that we have been drawn into this world's struggle, we will be aroused from our apathy.

NO OCCASION FOR FINANCIAL DISQUIET

WE HAVE seen a number of communications and interviews and have overheard conversations all along the same pessimistic line that because the United States has joined in the world war, business is going to the "bally bow-wows."

Nothing makes a panic quicker than a loss of business confidence. Prosperity is a very temperamental condition—let the people lose their heads, hoard their money, shorten orders and otherwise retrench for fear of money tightness

and hard times are bound to follow, however little excuse there may be for panic. It is distinctly up to the business interests of this country, not only on their own account, but as a patriotic duty to the nation, to do everything in their power to prevent a money panic at this critical juncture, because nothing could be more inimical to our prospects of success and chances of being of material aid to the allied cause. At no time in our history has it been more important that we keep cool-headed, for we have a great deal of very important work to do in the next few months.

All of those responsible in the slightest degree for the actions of others must take pains to display nothing but a hopeful and confident expectancy as to the developments. No country in the world has more resources at its command in normal times than has this country and with all the other countries of comparable size far below normal, because of the war which they have been waging for three years, it follows that the United States is the best positioned today to wield a decisive influence in the outcome. Actuated by no desire of conquest but by interest only in the cause of humanity and democracy, we are going into the conflict with a spirit that also augurs well for our succeeding.

With therefore not the slightest prospect of failure and with the participation in war occasioning a greater production because of a greater consumption of practically everything on which human subsistence depends, there will be work for all and with labor fully occupied more money will be in circulation than ever before in our history.

Metal and Rubber Markets

Heavy Demand for Steel From Home and Abroad

With mills flooded with orders and heavily sold ahead, with scarcity of vessels and the congestion of the railroads, the situation has presented a serious problem. This state of affairs is reflected in slowly but steadily advancing prices. The position of the market as a whole is such that it is impossible to quote a standard price for anything. Although government contracts are given preference, the quantity of rolled and finished structural steel required by the Government does not aggregate much over 3 per cent. of the total steel output of the mills. The immense amount of material in finished and semi-finished shape which will be needed to fill requirements as outlined by the War Department will call for a tonnage that can hardly be estimated. Quotations on May 8th were:

Steel Products Prices

Bessemer billets, per ton, mill	80 00	a	85 00
Open hearth, per ton, mill	80 00	a	85 00
Sheet bars, per ton	80 00	a	85 00
Forging billets, per ton, mill	100 00	a	110 00

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill; smaller lots are $2 per ton higher:

Blue Annealed Sheets—	Cents per lb.		
Nos. 3 to 8	6.50	a	7.50
Nos. 9 to 12	6.50	a	7.50
Nos. 13 to 16	6.50	a	7.50

No. 17 and lighter gauges are based on $6.50 a $7.50 per 100 lbs. for No. 28 Bessemer black sheets.

Box Annealed Sheets, Cold Rolled—			
Nos. 17 to 21	6.30	a	7.30
Nos. 22 and 24	6.35	a	7.35
Nos. 25 and 26	6.40	a	7.40
Galvanized Sheets of Black Sheet Gauge—			
Nos. 10 and 11	7.50	a	8.50
Nos. 12 to 14	7.60	a	8.60
Nos. 15 and 16	7.75	a	8.75
Nos. 17 to 21	7.90	a	8.90
Nos. 22 and 24	8.05	a	9.05
Nos. 25 and 26	8.20	a	9.20

Above prices are for Bessemer stock. For open hearth stock $2 per ton advance is charged.

Iron and Steel at Pittsburgh

Bessemer iron, Valley furnace	42 00	a	45 00
Bessemer steel, f.o.b. Pittsburg	75 00	a	....
Skelp, grooved steel	3 50	a	3 75
Sheared steel skelp	3 75	a	4 00
Ferromanganese (80 per cent.)	425 00	a	450 00
Steel, melting scrap	27 00	a	....
Steel bars	4 00	a	4 25
Antimony, February shipment	20c		
Manganese ore, per unit	80c		
Black sheets, 28-gauge	5 25	a	6 00
Galvanized sheets, 28-gauge	8 00	a	9 00
Tank plates	6 50	a	....

Aluminum

There is no change in the position of aluminum, and the market remains steady on the basis of previous quotations. Virgin ingots No. 1 on spot are offered at 59 to 61c. Pure remelt, 98 to 99 per cent., is quoted 56 to 58c., and No. 12 alloy remelt at 40 to 42c.

Finished Products

Sheet zinc	$19 00	a	....
Sheet aluminum, 1917 contract	42 00	a	....
do, outside market contracts	65 00	a	75 00
do, outside market prompt shipt	75 00	a	80 00
Aluminum wire, outside market prompt shipment	70 00	a	75 00
Copper wire	39 00	a	42 00
Sheet copper, hot rolled	40 00	a	....
Sheet copper, cold rolled	41 00	a	....
Copper in rolls	40 00	a	....
High brass sheet	39 00	a	44 00
High brass wire and light rods	40 00	a	44 00
High brass heavy rods	36 50	a	39 50
Low brass sheet, wire and rods	41 00	a	43 00
Bronze sheet, wire and rods	43 25	a	46 00
Brazed brass tubing	46 00	a	48 00
Brazed bronze tubing	46 00	a	48 00
Seamless copper tubing	....	a	....
Seamless brass tubing	43 00	a	46 00
Seamless bronze tubing	46 00	a	48 00
Full lead sheets	11 00	a	....
Cut lead sheets	11 25	a	....

Scrap Metals

	—Cents per pound— Buying.	Selling.
Copper—		
Heavy cut & crucible	27.00a27.50	29.00a29.50
Heavy and wire	25.50a26.00	26.50a27.00
Light and bottoms	23.00a23.25	24.50a25.00
Heavy machinery comp.	23.00a23.25	24.50a25.00
Brass, heavy	16.00a16.50	17.50a18.00
Brass, light	13.00a13.50	15.00a15.25
Lead, heavy	7.75a 8.00	8.50a 8.75
Tea lead	7.00a 7.12½	7.50a 7.75
Zinc scrap	6.50a 7.00	7.50a 7.75

The buying prices are those which the larger dealers will pay; the selling prices are market quotations.

Rubber Prices Higher

A slight upward trend was noticed in the past two weeks preceding the date of this writing. Dealers are not eager for future business owing to the problem of costs presented by the tonnage situation and the uncertainty as to war risk insurance. Quotations on May 9th were:

Para—Up-river, fine, per lb.	75	a	76
Up-river, coarse	51	a	52
Island, fine	72	a	73
Island, coarse	34	a	34½
Caucho, ball, upper	51	a	52
Caucho, ball, lower	49½	a	50
Cameta	36½	a	37
Ceylon—First latex, pale crepe	84	a	85
Brown crepe, thin, clean	79	a	80
Smoked, ribbed, sheets	..	a	..
Centrals—Corinto	..	a	50½
Esmeralda	..	a	50
Guayule, Saltillo	44	a	45
Balata, sheets	89	a	..
Balata, block, Ciudad	66	a	..
Mexican—Scrap	48½	a	..
Frontera	49½	a	..
African—Massai, red	63	a	..

Domestic Scrap Rubber

Boots and shoes	8½	a	8¾
Arctics, trimmed	7	a	..
Tires—Automobile	6½	a	..
Bicycles, pneumatic	4⅝	a	..
Hose, steam, fire	1¾	a	1⅞
Air brake	5½	a	5¾
Inner tubes, No. 1	24	a	..
Inner tubes, No. 2	11½	a	12
Red	11½	a	12

THE RITTMAN PROCESS for improvement in the manufacture of gasoline has been made available for public use. Senator James, of Kentucky, has offered a resolution authorizing the Secretary of the Interior to assign this process to the people of the United States.

IN CANTON, O., a bus line operates 5 passenger carrying trucks between Canton and Massillon, a distance of 8 miles on a regular schedule. These trucks are equipped with 37 x 5 in. Goodyear pneumatic cords, front, and 40 x 8 in. No-Hook, all weather tread cord tires, rear.

BOSCH MAGNETO Co., New York City, has closed contracts with the following truck manufacturers to use Bosch magnetos for the coming season: Bethlehem Motors Corp., Allentown, Pa.; Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.; Kleiber & Co., San Francisco, and the Sterling Automobile Mfg. Co., Amston, Conn.

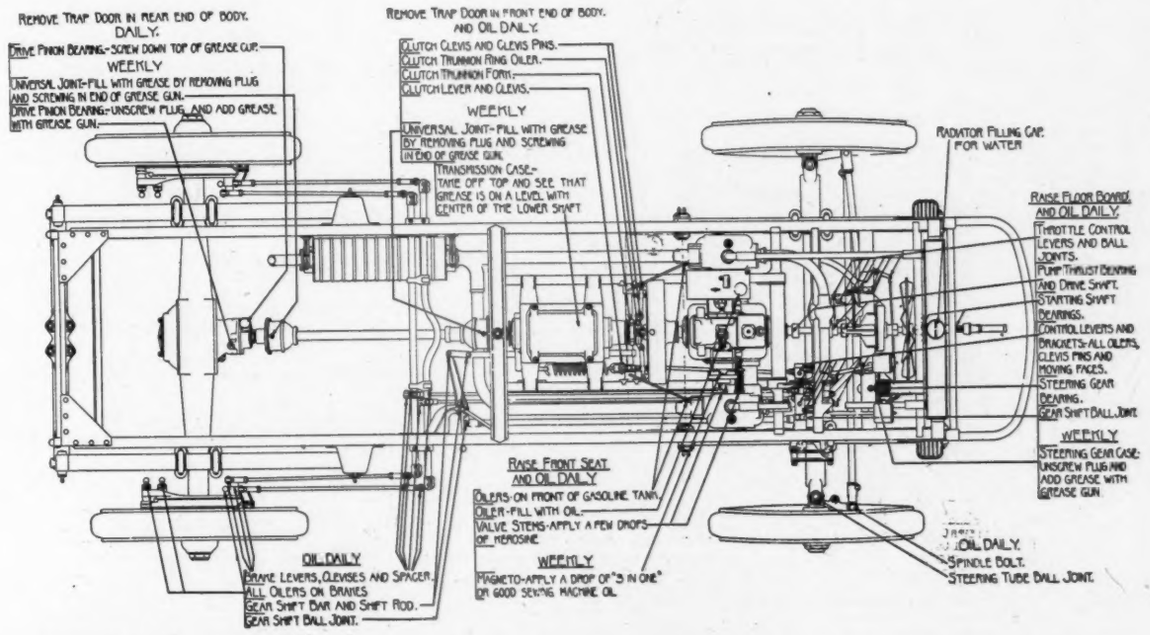
Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

Instructions for Drivers—IV

Lubrication; Truck Care and Inspection; Care and Adjustment of Brakes

Compiled by E. S. FOLJAMBE

LUBRICATION is probably as important as any one thing in connection with a commercial car. Even the beginner realizes that every moving part must be properly lubricated. No machine is made in which simply filling a tank cares for all moving parts. There are grease cups, the gear case and rear axle to be filled with oil or grease. The wheels, spring bolts, the leaves of the springs and many parts must be tended to individually, some with an oil can, others by simply screwing down the grease cups provided. The accompanying illustrations show plans and elevations of some well-known trucks with a list of the places to be lubricated. Study these diagrams carefully.


REMOVE TRAP DOOR IN REAR END OF BODY.
DAILY.
DRIVE PINION BEARING-SCREW DOWN TOP OF GREASE CUP.
WEEKLY
UNIVERSAL JOINT-FILL WITH GREASE BY REMOVING PLUG AND SCREWING IN END OF GREASE GUN.
DRIVE PINION BEARING-UNSCREW PLUG, AND ADD GREASE WITH GREASE GUN.
REMOVE TRAP DOOR IN FRONT END OF BODY. AND OIL DAILY.
CLUTCH CLEVIS AND CLEVIS PINS.
CLUTCH TRUNNION RING OILER.
CLUTCH TRUNNION FORK.
CLUTCH LEVER AND CLEVIS.
WEEKLY
UNIVERSAL JOINT-FILL WITH GREASE BY REMOVING PLUG AND SCREWING IN END OF GREASE GUN.
TRANSMISSION CASE-TAKE OFF TOP AND SEE THAT GREASE IS ON A LEVEL WITH CENTER OF THE LOWER SHAFT
RADIATOR FILLING CAP FOR WATER
RAISE FLOOR BOARD AND OIL DAILY.
THROTTLE CONTROL LEVERS AND BALL JOINTS.
PUMP THRUST BEARING AND DRIVE SHAFT.
STARTING SHAFT BEARINGS.
CONTROL LEVERS AND BRACKETS-ALL OILERS, CLEVIS PINS AND MOVING FACES.
STEERING GEAR BEARING.
GEAR SHIFT BALL JOINT.
WEEKLY
STEERING GEAR CASE: UNSCREW PLUG AND ADD GREASE WITH GREASE GUN.
RAISE FRONT SEAT AND OIL DAILY
OILERS-ON FRONT OF GASOLINE TANK.
OILER-FILL WITH OIL.
VALVE STEMS-APPLY A FEW DROPS OF KEROSINE.
WEEKLY
MAGNETO-APPLY A DROP OF "3 IN ONE" OR GOOD SEWING MACHINE OIL
OIL DAILY.
SPINDLE BOLT.
STEERING TUBE BALL JOINT.
OIL DAILY
BRAKE LEVERS, CLEVISES AND SPACER.
ALL OILERS ON BRAKES
GEAR SHIFT BAR AND SHIFT ROD.
GEAR SHIFT BALL JOINT.

Plan View of a Well-Known Truck, Indicating When and Where to Lubricate, and What to Use

Don't neglect the grease cups in the morning.

Don't fail to see that the oil reservoir is full.

Don't feed too much oil into the engine, causing a cloud of light blue smoke at the exhaust; this causes carbonization of the cylinders, pre-ignition and trouble with the spark plug points, which become fouled.

Don't use nondescript oil, purchased on the road, if it can be avoided.

When and What to Lubricate

Kind of Lubricant to Use.—For oiling gasoline engines, cylinder oil may be used; for transmission and rear axles use semi-fluid oils or grease; for universal joints and wheel bearings use heavy grease. Screw down oil and grease cups.

Parts Requiring Daily Attention.—Oil tanks should be full, using cylinder oil recommended by the maker. With the oil can lubricate the hand-lever pivot, steering-gear tube, spring bolts (if not provided with grease cups), both joints on the steering connections (if not booted and packed in grease), brake lever clevices, gear shift connections, starting crank bearing.

Parts Requiring Lubrication Every Two or Three Hundred Miles (Weekly or Once in Two Weeks).—The engine crankcase should be filled with cylinder oil to proper level. The transmission, if of the sliding gear type, should be lubricated with heavy oil, oil and grease, semi-fluid oils or greases, or compounds with graphite. All gears should dip into this lubricant at least two inches. Planetary transmissions require light oil. Keep the oil level below the main shaft bearings, otherwise the case may leak at the bearing end. The steering-gear case and the steering-gear housing should be packed with grease. For the rear-axle housing with the live axle, use any of the lubricants suitable for the transmission, from two to three pints being sufficient. If filled too full the lubricant will work out at the ends on the brake drums. Fill all grease cups.

Parts Requiring Lubrication Monthly.—The wheel-hub bearings should be filled with grease. The leather boots of steering connections, the universal joint, etc., and the half-time gears should be packed in grease, non-fluid oil, graphite grease, etc. The spark and throttle-lever connections should be lubricated with cylinder oil; or, if booted, packed with grease. The fan bearing, torsion arm and the forward end spring connection should be lubricated with cylinder oil. The magneto bearings require special magneto oil.

Parts Requiring Lubrication Every Two Months.—At about this interval the chains should be removed, cleaned with gasoline or kerosene, submerged in melted, heated chain lubricant with graphite, hung up to dry, wiped off and replaced. Graphite may be used with lubricants where recommended by the makers.

Requirements of Cylinder Oil

A cylinder oil should be non-carbonizing, that is, it must not deposit a layer of carbon in the combustion chamber; non-gummy, that is, it must be of the greatest body or viscosity possible, leaving no gummy residue after continued use; not affected by temperature, that is, it must retain its normal body while in use, permitting a uniform feed and not get thick so that it will not flow or turn into a watery substance; clean, that is, it must be free from all foreign and gritty matter, so as not to score the bearings, and non-acid, that is, it must contain no acids (acid sometimes remains in cheap oils, having been used to bleach the oil).

Opportunity comes to the well-informed. Read the CCJ

The transmission and differential case should be cleaned out thoroughly once a year with gasoline.

All oils for lubrication should be pure minerals, without any admixtures of animal or vegetable oils. The heavier the oil, the higher the fire test and viscosity test, but also in an oil of this character the darker will be the color which necessarily means a greater amount of carbon. It is therefore advisable to get as light an oil as possible, as color denotes very largely the amount of carbon contained in the oil. Buyers should be cautioned, however, against purchasing oils that have been bleached with acid. Oils that have their color lightened in this manner usually contain traces of acids which are destructive to the metal of the working parts of the engine, and oils of this character contain all of their original carbon.

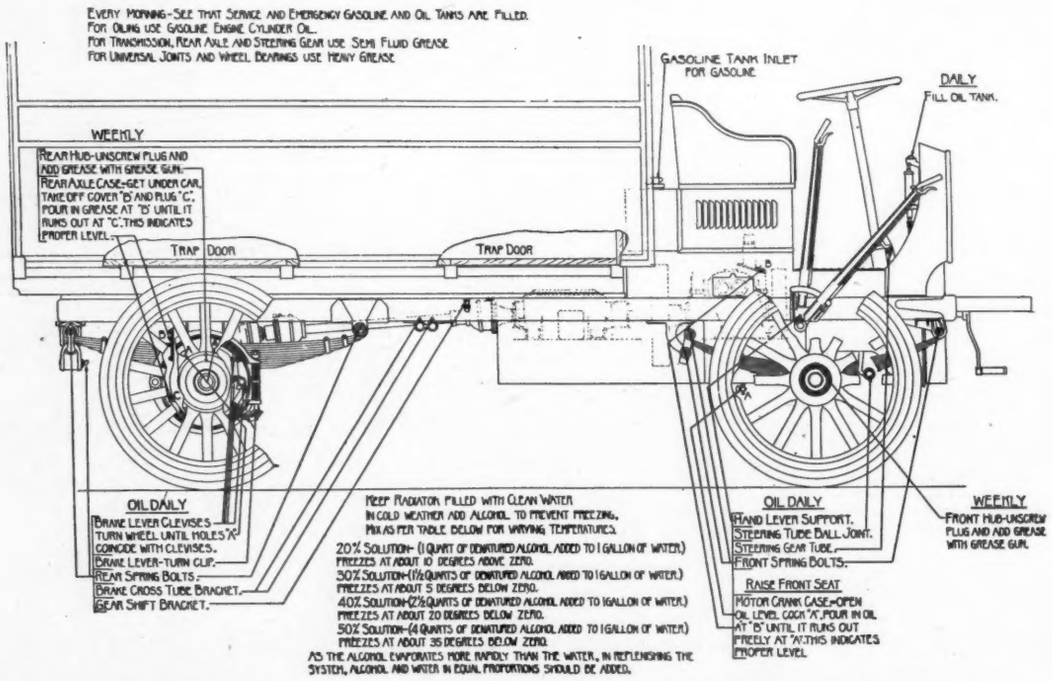
Free carbon can only be removed from an oil by actual filtration through bone black, fullers earth, etc., thus lightening the oil without deteriorating its lubricating properties.

Acid Test.—A very simple test to detect acid in an oil is with blue litmus paper which can be purchased at any drug store. This will show a pinkish color if there is any acid present. Another sensitive test, and a very practical one, is to partly cover a polished steel plate with a strip of flannel or lamp-wick saturated with the lubricant to be tested. Expose this to the sunlight for about twenty-four hours. When the plate is wiped dry if the lubricant is free from acid the steel will have retained its gloss. If dull spots have developed on the surface covered, it is the sign of the presence of acid.

Flash Test.—It is comparatively simple to make a flash test of an oil by heating a small quantity in a porcelain vessel over a Bunsen flame, stirring the oil with a thermometer and applying a lighted match to the surface of the oil occasionally. When a bluish flame spreads over the liquid and dies out quickly the temperature should be noted, for this is the flash point. From about 410 to 420 deg. Fahr. is a proper flash point.

No cylinder oil should have a flash point lower than 400 deg. nor higher than 450 deg. Fahr. The viscosity should not be lower than 200 at 70 deg. Fahr. nor higher than 500.

Cold Test.—Another point that is important, especially in winter time, is to obtain an oil with a proper cold test. It is practically impossible to give a mineral oil a very low cold test; and one that shows from 15 to 20 deg. below freezing point may be considered all right for the purpose. It is a very small matter to test this by taking a small quantity of the oil in a test tube and surrounding the test tube with three parts cracked ice and one part salt. The thermometer should then be introduced into the oil and the temperature noted at which it begins to solidify, for this is its cold test. It should be remembered that the darker the oil the poorer the cold test, as the heaviest oils solidify most rapidly.


EVERY MORNING-SEE THAT SERVICE AND EMERGENCY GASOLINE AND OIL TANKS ARE FILLED.
FOR OILING USE GASOLINE ENGINE CYLINDER OIL.
FOR TRANSMISSION, REAR AXLE AND STEERING GEAR USE SEMI FLUID GREASE
FOR UNIVERSAL JOINTS AND WHEEL BEARINGS USE HEAVY GREASE
GASOLINE TANK INLET FOR GASOLINE
DAILY
FILL OIL TANK.
WEEKLY
REAR HUB-UNSCREW PLUG AND ADD GREASE WITH GREASE GUN.
REAR AXLE CASE-GET UNDER CAR, TAKE OFF COVER "B" AND PLUG "C", POUR IN GREASE AT "B" UNTIL IT RUNS OUT AT "C". THIS INDICATES PROPER LEVEL.
TRAP DOOR
TRAP DOOR
OIL DAILY
BRAKE LEVER CLEVISES
TURN WHEEL UNTIL HOLES "X" COINCIDE WITH CLEVISES.
BRAKE LEVER-TURN CLIP.
REAR SPRING BOLTS.
BRAKE CROSS TUBE BRACKET.
GEAR SHIFT BRACKET.
KEEP RADIATOR FILLED WITH CLEAN WATER
IN COLD WEATHER ADD ALCOHOL TO PREVENT FREEZING.
MIX AS PER TABLE BELOW FOR VARYING TEMPERATURES.
20% SOLUTION-(1 QUART OF DENATURED ALCOHOL ADDED TO 1 GALLON OF WATER.) FREEZES AT ABOUT 10 DEGREES ABOVE ZERO.
30% SOLUTION-(1½ QUARTS OF DENATURED ALCOHOL ADDED TO 1 GALLON OF WATER.) FREEZES AT ABOUT 5 DEGREES BELOW ZERO.
40% SOLUTION-(2½ QUARTS OF DENATURED ALCOHOL ADDED TO 1 GALLON OF WATER.) FREEZES AT ABOUT 20 DEGREES BELOW ZERO.
50% SOLUTION-(4 QUARTS OF DENATURED ALCOHOL ADDED TO 1 GALLON OF WATER.) FREEZES AT ABOUT 35 DEGREES BELOW ZERO.
AS THE ALCOHOL EVAPORATES MORE RAPIDLY THAN THE WATER, IN REPLENISHING THE SYSTEM, ALCOHOL AND WATER IN EQUAL PROPORTIONS SHOULD BE ADDED.
OIL DAILY
HAND LEVER SUPPORT.
STEERING TUBE BALL JOINT.
STEERING GEAR TUBE.
FRONT SPRING BOLTS.
RAISE FRONT SEAT
MOTOR CRANK CASE-OPEN OIL LEVEL COCK "A", POUR IN OIL AT "B" UNTIL IT RUNS OUT FREELY AT "A". THIS INDICATES PROPER LEVEL
WEEKLY
FRONT HUB-UNSCREW PLUG AND ADD GREASE WITH GREASE GUN.

Plan of the Same Truck With Further Instructions as to Lubrication and Inspection

Results to the Engine of Lack of Lubrication

Bear in mind, letting the engine run dry once may make it necessary to take down the entire machine, and even to rebore the cylinders and replace the pistons and rings at a large expense.

Indications of Running Dry.—When the engine runs dry the first indication is overheating; it can be smelled and the cylinders will be over hot to the touch, the circulating water will boil. If continued, the engine will get so hot that the pistons will stick in the cylinders, first roughening up the inside of the cylinder bore so that regrinding or reboring will be necessary. The bearings, if of babbitt, will actually melt and run into the crankcase, and of course the main bearings will be scored and roughened, happen as any careful driver will note the necessitating renewal of the bearings and shaft.

There is no excuse, however, for this to happen as any careful driver will note the falling off in power of the engine and its overheating long before it reaches the point of ruination. Keep the oil screen clean.

What to Do When the Engine is Overheated.—If from lack of lubrication: Fill the crankcase to the proper level with cylinder oil with the engine still running. If it stops before lubrication reaches the cylinders you may not be able to start it again. Cold water can be put into the radiator with the engine running, allowing the drain petcock to be open, so that the cold water will not come suddenly against the cylinders but will mix gradually with the hot water of the circulating system. When well circulated, close the drain cock.

Overheating Also Due to Defective Water Circulation.—The engine may also overheat due to defective water circulation even if the oiling is all right. If the pump fails to work or there is a stoppage in the line or the water has been accidentally drained out of the radiator by a petcock shaking open or being struck by underbrush, the engine may overheat. The oil will then be burned off of the cylinder walls, and the damage may be as great as though lack of lubrication were the cause.

How often the radiator should be filled is a matter that differs with each machine and varies even with the severity of the service. Much running on low gear will occasionally cause the radiator to boil over. If this has happened the driver should make an inspection as soon as possible after the engine and water have cooled down. When still overheated, hot steam in the pipes may be holding the water up in the radiator, giving it the appearance of being full. The inspection should be made with the

engine running so that the water will be in circulation, but not when it is boiling. There is danger in removing the radiator cap when overheated, as a column of steam and water may be forced up into one's face.

Putting Up the Car at Night

After the truck has done a satisfactory day's work and returns to the garage the driver should give it at least the same care and attention that he would give a horse. The various inspections previously mentioned should be given, as only in this way can satisfactory service be obtained.

The car should be washed each night as soon as it comes into the garage, or at least three times a week in ordinary service. Care should be taken not to play the hose directly on the magneto or the motor, the chains or other parts which cannot be dried readily. If the dirt gets hard it will require a higher pressure to remove it; this is injurious to the finish. Slightly warm water should be used if possible, but not so hot as to dull the high finish of panel bodies. Be careful not to rub the surface until after all of the dirt has been removed by the water, especially on the body parts, as scratching will result. The wheels, however, can be sponged down with soapy water. Drying of the highly finished parts should be done with a chamois.

The engine should be cleaned by wiping it off daily so that dust and dirt will not accumulate and loose nuts and bolts can be detected.

Special tanks are now on the market for cleaning the engine and other oily parts by a pressure stream.

The foregoing applies to companies that desire to keep their vehicles looking fresh and up-to-date. If this cannot be done owing to the strenuousness of the service, the owners will have to pay the penalty by heavier repair bills and painting costs.

Truck Care and Inspection

The various parts of the truck in addition to the engine, such as the change speed gears, brakes, the chains, tires, etc., should be carefully inspected whether any definite trouble has made itself known or not.

In large installations this is done by a competent repairman who cares for all vehicles. The individual driver, however, where only one or two trucks are in service, must do this work himself, either at night when in the garage, or before starting out in the morning, preferably at night so that, if defective parts are found, they can be remedied before the next morning.

Inspection of Wheels.—About every three months the wheels should be taken off and the bearings examined, cleaned out thoroughly, packed and replaced.

Replace the wheel, turn up the nut until too tight for the wheel to revolve, then give the nut half a turn backward and run the pin through the axle nut. The wheels should balanace freely, but must have no side play. At the ordinary inspection the wheels should be given a jerk to see that there is no lateral looseness.

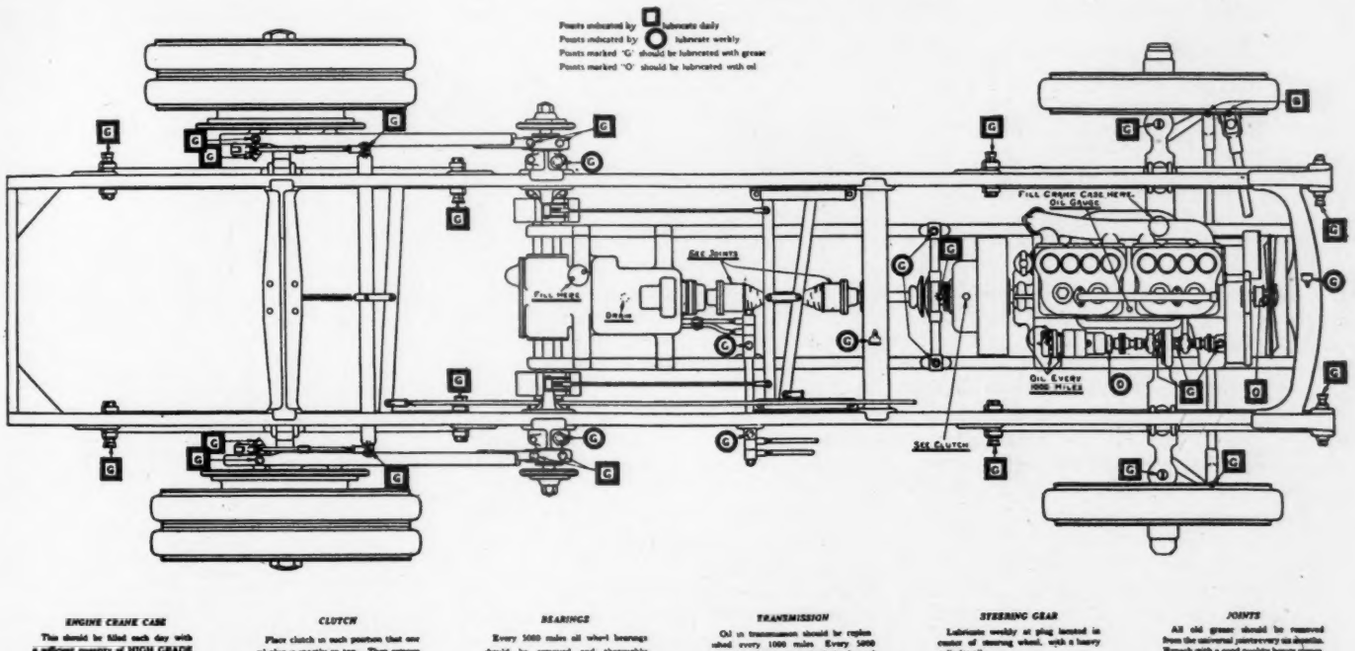
Examine the Paint for Cracks.—Loosened parts are often detected by cracking of the paint around them. This shows a movement of one part relative to the other where no movement should take place. Keep the truck clean so that the paint can be seen.

Chains and Sprockets.—Care should be taken to maintain the correct chain tension. Too slack a chain may run off a sprocket and cause considerable damage. Remember that the chain pitch, that is, the distance from the center of one link to the center of the next, increases with wear so that the chain will not fit properly over the teeth of the sprockets. To test chain condition as to wear, hold the chain by the ends on edge with the side links on the top and bottom and note the amount of sag. A new chain will sag very little, while an old one will sag twice or three times as much.

Chains too tight will wear and climb the sprockets, causing unnecessary loss of power, wear on the teeth of the sprockets and parts of the chain and the sprocket bearings. When in place the under half of the ordinary truck chain should sag about two inches from the straight line when idle. A badly worn chain should be replaced; removing links to tighten it will not remedy the trouble.

The countershaft sprockets can readily be reversed so that the unworn side of the teeth will be presented to the chain. These, on account of their smaller size, wear more rapidly than the rear sprockets.

Cleaning Chains.—After removing the chain, place it in kerosene, scrub it with a brush until the grit is removed, then submerge it in tallow or chain lubricant with graphite, which must be heated to keep it fluid, care being taken not to boil it. Hang the chain up and wipe off the superfluous lubricant. This practically packs all of the small bearings of the chain with a more or less enduring lubricant. If the chains cannot be removed for lack of time, they may be cleansed with a stiff brush and kerosene and then lubricated after the axle has been jacked up, by rubbing on a non-fluid oil with graphite. The chain should be run not more than 1500 miles before being cleaned and lubricated. We now come to the important item of brakes.


Points indicated by ☐ lubricate daily
Points indicated by ○ lubricate weekly
Points marked 'G' should be lubricated with grease
Points marked 'O' should be lubricated with oil
FILL CRANK CASE HERE. OIL GAUGE
SEE JOINTS
FILL HERE
DRAIN
OIL EVERY 1000 MILES
SEE CLUTCH
ENGINE CRANK CASE
The should be filled each day with a sufficient quantity of HIGH GRADE cylinder oil to come gauge on opposite side of crank case to run to upper end of slot. Every 1000 miles the crank case should be drained of all old oil and refilled as above stated.
CLUTCH
Place clutch in such position that one oil plug is exactly on top. Then remove this upper plug, together with one of the plugs on the side, and fill with a light mineral oil until it overflows from opened side plug. Test oil level every two weeks.
BEARINGS
Every 5000 miles all wheel bearings should be removed and thoroughly cleaned with kerosene. Repack with a good quality high grade grease
TRANSMISSION
Oil in transmission should be replaced every 1000 miles. Every 5000 miles transmission case should be drained and cleaned with kerosene. Refill with a High Grade transmission oil
GEAR CHANGE GATE
Lubricate all sliding surfaces weekly
STEERING GEAR
Lubricate weekly at plug located in center of steering wheel, with a heavy cylinder oil.
DRIVE CHAINS
Chains should be taken off weekly and cleaned in kerosene. Then soak in a bath of hot tallow
JOINTS
All old grease should be removed from the universal joints every six months. Repack with a good quality heavy grease.
SPRINGS
Every three months a small quantity of oil should be injected between the leaves. This will insure easy riding.

Elevation of Another Make of Truck, Showing Parts to Receive Attention and What They Need

Care and Adjustment of Brakes

Driving with brakes out of adjustment or inoperative is dangerous. The safety of not only the truck and load but also that of the driver and pedestrians or other vehicles is absolutely dependent upon the condition of the brakes. The larger the brake sur-

face the longer the materials in contact will wear. Braking produces great heat. Small brakes are, therefore, overheated and the materials burned or charred much more easily than large brakes. A burned brake should be renewed at once.

Brake bands should be inspected to see that they do not drag, causing unnecessary wear and loss of power. A slightly dragging brake band can be detected after running as the brake drum will be warm to the touch even when it drags so slightly that it is not noticeable to the eye.

Do not use oil on leather or fabric-faced brakes. Metal-to-metal brakes may be oiled to prevent roughening.

Brake connections, rods and cotter pins should be carefully looked to to see that they are in condition, and the brakes should be tested to see that they free themselves completely from the drums when released. The careful driver uses his brakes very little, controlling the speed very largely by the throttle.

PREPARING THE ENGLISH TO BUILD HENRY FORD'S TRACTOR

While the trade is awaiting the tractor which Henry Ford & Son have been perfecting for so long, the tractor plant at Dearborn, Mich., is being kept busy turning out special tools for shipment to England, where the manufacture of these tractors is to be undertaken on an extensive scale. This is in accordance with the agreement whereby Henry Ford waived all his British patent rights on the tractor in favor of the English government, so that the government could proceed to manufacture these tractors in an effort to increase the cultivated areas throughout the kingdom and at the same time make up in part for the shortage of labor because of the thousands of men who have gone from the rural districts to the front.

It was found that waiving the patent rights was not sufficient if the desired results were to be accomplished this summer. English factories could not be transformed fast enough to insure an output of tractors that could be put into service within a reasonable length of time. The making of the special tools from drawings would be laboriously slow, and even then the outcome would be doubtful. So it was decided to build the tools and other necessary machinery in this country and rush them abroad.

It has not yet been determined where the British government tractor plant will be located, although London probably will be chosen. It is a purely governmental enterprise, with no hope of making a profit, but prompted by the belief that the increased acreage will be sufficient to guard against a food famine. The plan is enormously expensive, many of the details being cabled to London; but money cuts no figure when pitted against the exigencies of modern warfare.

A new model of the farm tractor with which Mr. Ford has been experimenting for years on his estate at Dearborn has proved so satisfactory in its operations that it is expected he will shortly give his official approval. As soon thereafter as possible the production of tractors for the American market will commence, although it probably will be Fall before the output reaches any considerable proportions.

CONSISTENT RECORD ESTABLISHED BY RADIATOR MANUFACTURER

As we review the statistical and industrial advance of the automobile industry and its allied parts for the year 1916, our attention is attracted to the consistent progress that has been made by the Long Mfg. Co., of Detroit. For 13 years this institution has been manufacturing cooling systems for motor cars, trucks and tractors.

The ever increasing demand for their products have compelled them, from time to time, to build new plants and acquire additional floor space. During the past year they leased 20,000 sq. ft. of adjoining property, but with the beginning of this year they have rearranged their present plant at East Grand Boulevard and Cameron Ave., Detroit, so as to bring this additional production into one building. This necessitated the elimination of their large employees' lunch room, as well as their general offices, all of which space was filled with machinery and manufacturing equipment. They have just completed an additional third story to their plant, which will take care of their general offices, designing, engineering and draughting departments.

During the past year they manufactured and delivered Long cooling systems in a quantity in excess of 160,000 to 65 manufacturers of motor cars, trucks and tractors. With the increased manufacturing facilities in the additions they have made to their plant, they have for this year a factory capacity of 225,000; or, 750 complete radiators per day.

Their present factory is one of the most efficiently equipped plants in Detroit, which accounts for the enormous production they are able to attain in a comparatively small floor space area. They have sufficient and adequate departments to manufacture all parts that enter radiator construction, including copper and nickel plating, polishing, foundry work for their own castings, as well as a completely equipped machine shop in which they make all their own tools, dies and fixtures.

Their testing laboratory permits a most careful survey and knowledge of every modern improvement and engineering advancement in radiation. Co-operation with the engineering departments of motor car makers enables them to develop and perfect the proper radiator for the particular engine which it is designed.

They are now employing over 600 men.

SMITH MOTOR TRUCK CO., Los Angeles, Cal., has been succeeded by the Smith Form-a-Truck Co., under the ownership of W. O. Gates and Leo L. Kelley. These men have been connected with the motor car industry in California for the past seven years, and previous to that conducted the Broadway Motor Car Co., Denver, Col.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of Commercial Car Journal, published monthly at Philadelphia, Pa., for April, 1917.

State of Pennsylvania,
County of Philadelphia, ss.:

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared James Artman, who, having been duly sworn according to law, deposes and says that he is the Editor of the COMMERCIAL CAR JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:
   Publisher, CHILTON COMPANY, 49th and Market Streets, Philadelphia, Pa.
   Editor, James Artman, Narberth, Pa.
   Managing Editor, E. S. Foljambe, Drexel Hill, Pa.
   Business Manager, C. A. Musselman, 4203 Pine Street, Philadelphia, Pa.
2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)
   James Artman, Narberth, Pa.
   George H. Buzby, 4412 Walnut Street, Philadelphia, Pa.
   C. A. Musselman, 4203 Pine Street, Philadelphia, Pa.
3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also, that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and that this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAMES ARTMAN, Editor.

Sworn and subscribed before me this 23rd day of March, 1917.

GEORGE H. SHEVLIN.

(Seal)
(My commission expires April 1, 1917.)
Form 3526-Ed. 1916.

CHAS. CLIFTON, president of the N. A. C. C., and John N. Willys have become representatives of the N. A. C. C. on the National Industrial Conference Board, composed of 16 national organizations of manufacturers for the consideration of matters affecting industrial development. This body was organized last May for the purpose of presenting to the public and legislative bodies the business men's side of important matters. The data collected and the conclusions and recommendations the board passes on them will be distributed widely through an official publication, copies of which will be placed at the disposal of the representatives of the public charged with making the laws which affect and regulate industry. An intelligent digest and interpretation of current events in the industrial field will also be issued.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

The Hudson Truck Axle

THE Hudson Motor Axle Co., Philadelphia, Pa., is a new organization, headed by William F. Hudson, who has become widely known in the automobile trade through his organizing and marketing the Hudford truck forming unit for Ford cars. The new axle to be marketed by this company was developed by Mr. Hudson, with the assistance of Minor Harvey, also of Philadelphia.

The axle is of the worm-driven type and unique, particularly for the mounting of the gears at the center and the way in which the driving effort is taken on the supporting members. Practically, the axle housing is merely a support for the parts which really mount and hold the gears. The cover plates fitting front and back of the opening in the center of the housing have projecting lugs on the inside. Those of one plate meet those of the other when the two plates are assembled on the housing. The lugs are bored transversely, i. e., longitudinally of the axle, forming seats for the differential bearings, and four bolts pass through these bearing lugs, front to back, holding the whole as a solid unit; in fact, the entire moving part of the center of the axle could be assembled to run without putting it in the axle housing.

The principal feature, aside from this unique construction, is that, by thus mounting, the gears are so readily changed that it becomes a matter of but little labor to change the gear ratio if it becomes desirable. Usually the axles are furnished with 7¼, 8 or 8¾ to 1 ratios, but higher or lower can be had if necessary or desired.

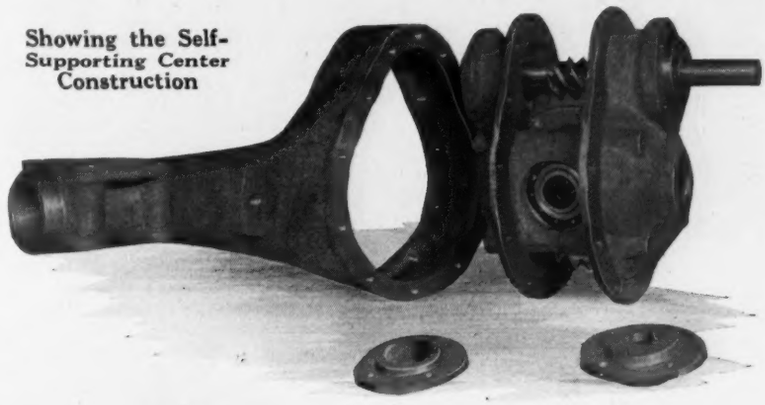
The axle housing is a steel casting of form to give a trussed support at the center so that it will be stiffened for carrying heavy loads, and carries the live axles in more or less the conventional arrangement.

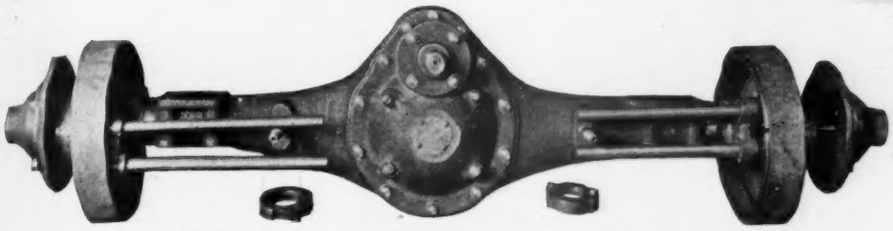
The spring seats are on the top of the axle, as shown in the illustration, and the worm above the worm wheel following the universal practice. The worm is chrome nickel steel and the worm wheel a high tin bronze. Ball bearings are used for the support of the differential and combined radial and thrust ball bearings for the worm shaft.

The wheels are mounted on tapered roller bearings. The axle is of full-floating type, the wheels being mounted on dead axle tubes, as shown in the section. These are pressed steel and secured in the ends of the axle housing casting.

These axles are to be built for sale to assemblers of 1½-ton trucks. The weight complete is 575 lb. A 1-ton size of the same design is also to be put on the market.

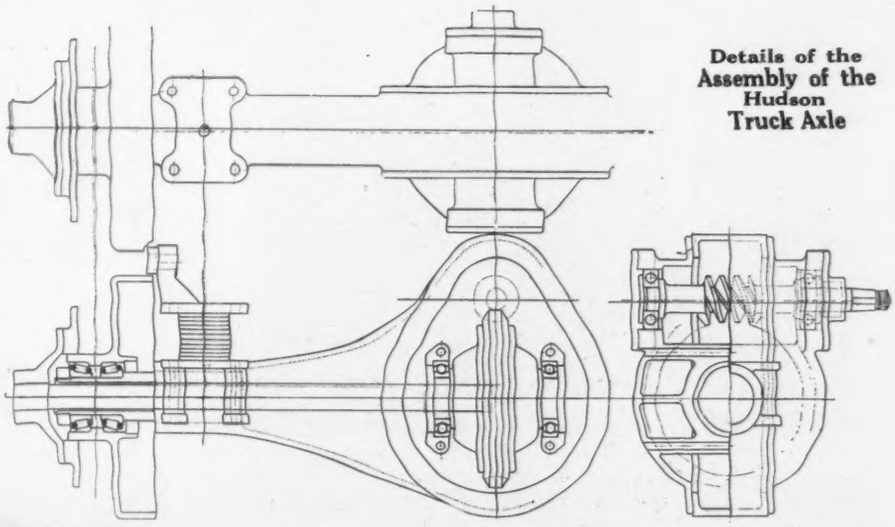
Showing the Self-Supporting Center Construction

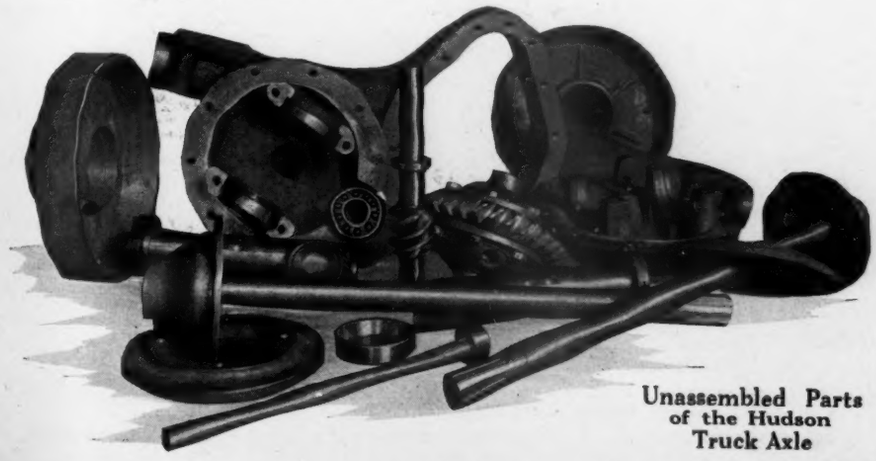




Hudson Motor Truck Axle With Brake Rigging Partly Removed to Show the Housing

Details of the Assembly of the Hudson Truck Axle

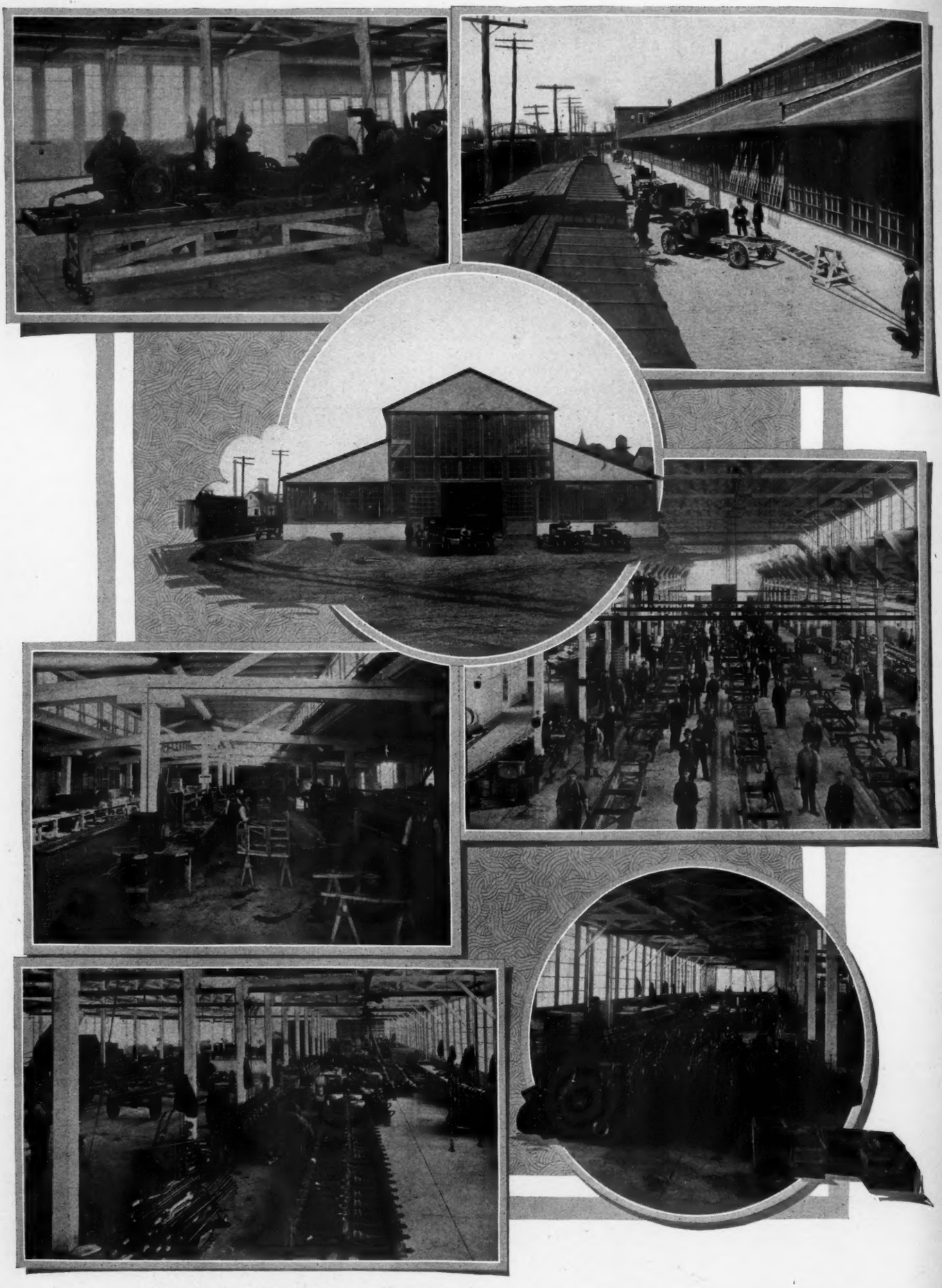




Unassembled Parts of the Hudson Truck Axle

MONTREAL AUTOMOBILE TRADE ASSOCIATION has undertaken the collection and forwarding of old motoring magazines to the soldier boys in the Montreal Military Hospital. T. C. Kirby is devoting his energies to the organization of this work, and parcels will be gladly received at the headquarters of the Association, Room 9, Windsor Hotel, Montreal, Canada.

Merit wins—that's why the CCJ is the leader



Interior Views of the Bethlehem Motor Corporation's Plant

The frame is supported by the assembling stand while the springs, wheels, etc., are fitted. Then the chassis is reversed and is ready to progress on its own wheels. The upper circle shows one end of the main assembling plant. This company is not experiencing any shortage of material as the pictures indicate.

The CCJ is built upon the lasting foundation of honest circulation

How the Bethlehem Truck is Built

The Modern Plant of the Bethlehem Motors Corporation and Features of the Truck

ALTHOUGH the Bethlehem Motors Corp., Allentown, Pa., announced its initial truck only two months ago, the present output averages about 15 per day. If present indications may be taken as a criterion, the estimated output of over 5000 trucks for the first fiscal year will surely be exceeded.

The personnel of the company consists of Arthur T. Murray, president and general manager, formerly vice-president of the Brady-Murray Motors Corp., of New York; D. G. Dery, of Allentown, vice-president, and Martin E. Kern, of Allentown, secretary and treasurer. These gentlemen and W. S. Stevenson, of Allentown, form the directorate.

Progressive assembly is made use of in building the two models upon which this company is specializing at the present time. The Bethlehem truck is essentially an assembled product and in the main is composed of such units which have been accepted by the trade as standard.

The plant is divided into six units, viz., the office building, assembly department, body shop, first testing department, paint shop and final testing department. The main building, which houses the assembly, paint and testing departments, is 90 ft. wide by 475 ft. in length, and together with the office and body shop gives about 85,000 sq. ft. of floor space. The shipping facilities are very adequate, as the plant is located on the main line of the Central Railroad of New Jersey, and has a railroad frontage of 1600 ft. The shipping platform is 750 ft. long by 20 ft. wide.

In order that Bethlehem truck dealers may have the best there is in the way of service, this company is erecting a special building for this service.

For the present only the smaller Bethlehem model is being regularly furnished with a stock body. Either a stake or open express can be had. The larger model is furnished with the regulation driver's seat and cab top, with special bodies to order.

The Plant of the Bethlehem Motors Corporation

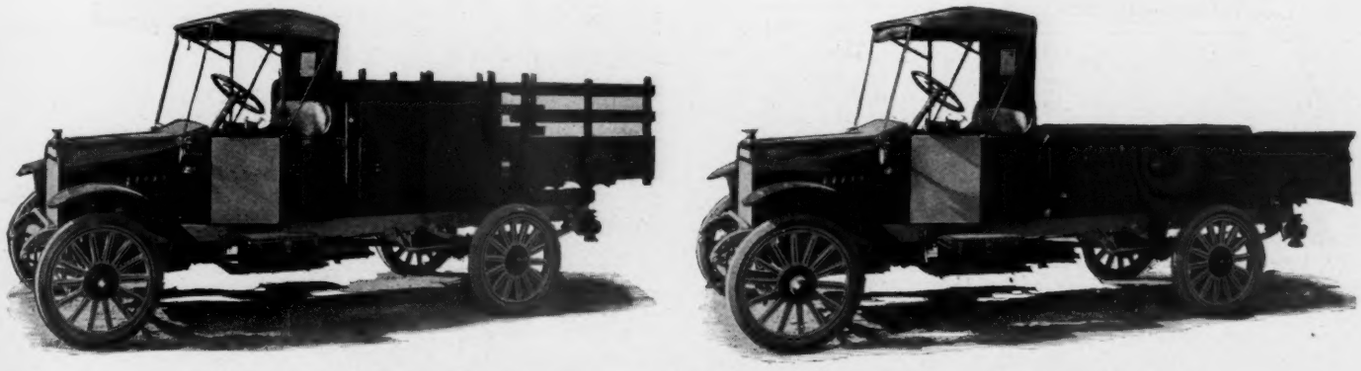
Details of the Bethlehem Truck

The Bethlehem line consists of two models—1¼ and 2¼ tons capacity. Both models follow the same general design, making such structural changes as necessary to meet the requirements of the two different capacities. The engines used in both models are the L-head type. The engine in the smaller size is of Golden, Belknap and Schwartz make, 3¾-in. bore by 4¼-in. stroke; cylinders cast in block. In the larger model a North American engine is used, 4-in. bore by 4½-in. stroke. It is interesting to note that this same make of engine is being used in the "tanks" which have done such effective work across the water. The cylinders are cast in pairs to permit of a longer center crankshaft bearing necessitated by the heavier load imposed on the engine. Cylinders and pistons are carefully ground to size, and all bearings are hand scraped. The upper half of the crankcase supports the crankshaft as well as the cylinders, thus rendering the lower half readily removable for inspection of all bearings.

The oiling system is of the constant circulation type, assuring perfect lubrication at all engine speeds.

Cooling is by thermo-syphon system. A Fedders special design of truck radiator is used having large cooling surfaces. The radiator is spring mounted in such a manner that warping or weaving of the frame cannot affect the radiator in the least. Ignition is by Bosch high tension magneto.

The transmission on both models is mounted directly to the rear end of the en-



The Bethlehem One and a Quarter Ton Truck Fitted With Stake and Express Bodies

Make your product pay—advertise in the CCJ

gine base, thus making a positive alignment between the motor crankshaft and the main transmission shaft. All shafts run on ball or roller bearings, and gears and shafts are of chrome nickel steel. The gears are case hardened and ground. The final drive to the rear axle is through two universal joints and tubular propeller shaft, with practically no angle of deflection between the main transmission shaft and the final drive to the rear axle.

Both models are fitted with Pierce governors which regulate the road speed. The maximum speed for the 1¼-ton is 18 m.p.h., and for the 2¼-ton, 15 m.p.h. The frames on both the 1¼ and 2¼-ton trucks are of cold pressed alloy steel, 3-16 in. thick on the 1¼-ton truck and 1¼ in. thick on the 2¼-ton truck. The former frame is 5 in. deep with top and bottom webs of 3 11-16 in. width. The large truck has section 5½ in. deep, with top and bottom webs 3 11-16 in. wide. The distribution of the pay load is such as to assure maximum riding comfort whether the truck is loaded or light.

The makers call special attention to the stability of such parts as the fenders, brake control rods, etc. All such parts are built extra heavy and in harmony with the major units entering into the construction of these trucks. The fenders are strengthened along the entire outer edges with angle iron—electrically spot welded to the fenders. This eliminates the objectionable drumming of the fenders and prevents them from becoming dented and easily smashed.

The rear axles of both models are of the internal gear type, made by the Russel Motor Axle Co., making it possible to carry the load in the 1¼-ton truck on a double heat-treated nickel steel solid axle, 2 1-16 in. in diameter, while in the larger truck the diameter of the axle carrying the load is 3 in. and made of the same material. The gear reduction on the small truck is 7.4 to 1; on the large one, 8.3 to 1. The wheels run on large size roller bearings, as do the jackshafts and the differential.

Other specifications are as follows: Worm and nut irreversible steering gear, dry disc clutch, Lavigne steering gear, I-beam drop forged nickel steel front axles, roller bearings throughout; two sets of brakes on the rear wheels, semi-elliptic springs on both models, 38¼ x 2¼-in. front springs and 51¾ x 2¼-in. rear, on the small models; 37½ x 2¼-in. front and 51¾ x 3-in. rear on the large model. The wheelbase on the small truck is 126 in., 56 in. tread; on the large model, 144 in., 56-in. tread in front and 61 in. in rear.

Two types of bodies are supplied as standard on the 1¼-ton truck. The bodies are finished in standard black, both for the flareboard and stake type. The price of the truck is $1165, while the chassis furnished either in the lead or standard finish is $1125. The 1¼-ton chassis finished in lead or standard color—Chassis, emerald green; hood, fenders, cowl and seat, black; doors, emerald green, $1125. Furnished, complete, with either standard flareboard or stake body and bow top, $1165. The 2¼-ton chassis finished in the lead or standard color, chassis, emerald green; hood, fenders, cowl and seat, black; doors, emerald green, $1665. All prices f.o.b. cars, Allentown, Pa.

A SUCCESS ATTAINED IN THE AUTOMOTIVE INDUSTRY

WILLIAM F. HUDSON, who first came to prominence in the motor car field through his development and marketing of the Hudson truck forming unit for Ford cars, is again in the public eye through his promoting of a new enterprise to manufacture a truck axle. The axle is of the worm-driven full-floating type and will be put out by the Hudson Motor Axle Co.

It is interesting to know something of this man's earlier career, because it shows that success in this industry is not confined to those of long connection with it. Truly

WILLIAM F. HUDSON

a self-made man, he has achieved prominence relatively late in life and after years of vicissitudes in humble lines. Handicapped with a preliminary education that carried him only through the Philadelphia grammar schools, he had to go to work at the age of 14 and many and varied were his occupations until the age of 20, being employed in a pawn shop, making a window cleanser, then in a pool room, next huckstering and then selling stationery supplies.

At this stage of his life he went to sea as a cook, but after a year returned to shore occupations. He was a teamster from the age of 20 until 1910, when he went into the roofing supply business, later opening a New York branch and during this time formed the Petroleum Coke Co. It was only during these years that he accumulated capital to undertake much in the way of promoting enterprises and early in 1914 he opened the Philadelphia Motor Mart, which later in that year was turned into the Ford Specialty Co.

During this year he invented the Hudford Slip-On running boards, which were later patented, and also developed the Hudford unit in its present form. The next year he formed the Hudford Co., and started manufacturing the units in quantities, losing considerable money while getting this undertaking under way. Converting his other interests, he confined himself to this one endeavor until it was so successfully established that he was able to sell half and then the rest of his holdings with a profit of over half a million.

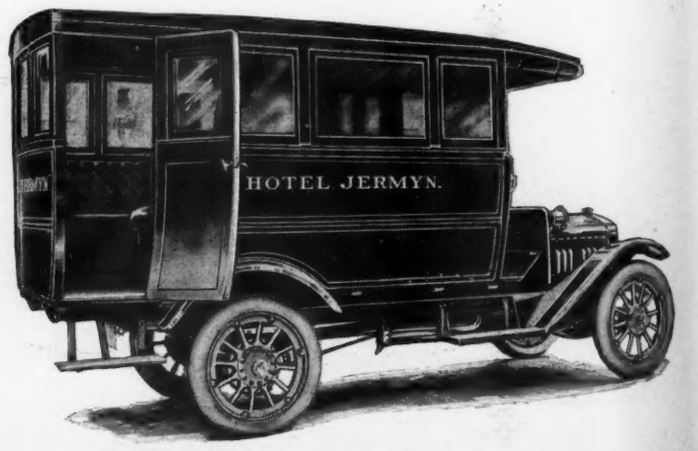
Always fascinated with the prospective possibilities of new developments he was now in position to devote himself to the most promising of these and he holds numerous patents and has others pending on inventions, principally automobile accessories or parts, among them being the worm-drive axle before referred to, a universal or slip joint, auxiliary motor car, valve grinder, universal unit for extending a pleasure car to one of longer wheelbase or to a light truck.

Mr. Hudson was married at the age of 21 and has a large family. Until about five years ago he had little success, principally from want of capital and unfortunate outcome of his efforts up to that time. His experience may be taken as an encouragement to those who have labored long with little return, for today he has more than made up for his past difficulties and is far better situated than most of those who were seemingly more prosperous during the period of his struggles.

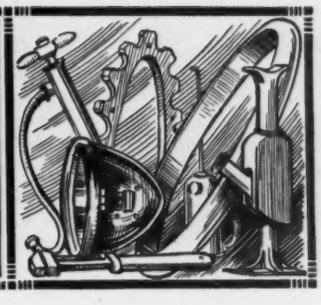
MARATHON TIRE & RUBBER Co., Akron, O., has put its plant on an 8-hour full pay basis, allowing operation of three 8-hour shifts. This action was taken to allow three 8-hour periods in production to take care of the increase in business.

Twelve-Passenger 'Bus Body

This twelve-passenger body is shown mounted on a fifteen hundred pound GMC chassis. Body dimensions are 62 x 108 in., and 66 in. high. It has drop-sash windows, and is upholstered in maroon leather. Price, $650. Made by the Champion Wagon Company, Incorporated, Oswego, N. Y.

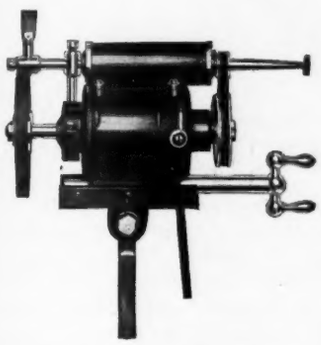


TRUCK ACCESSORIES AND APPLIANCES



DUMORE PORTABLE GRINDER

The many uses to which the Dumore portable grinder, made by the Wisconsin Electric Co., Racine, Wis., can be put, make it a very handy tool as part of garage equipment. It is a light, convenient tool, and can be set up in a lathe, milling machine or shaper in a few minutes ready for works. A Universal motor is used, operating on either direct or alternating current



The Dumore Grinder
Equipped with the extension arm for deep internal grinding

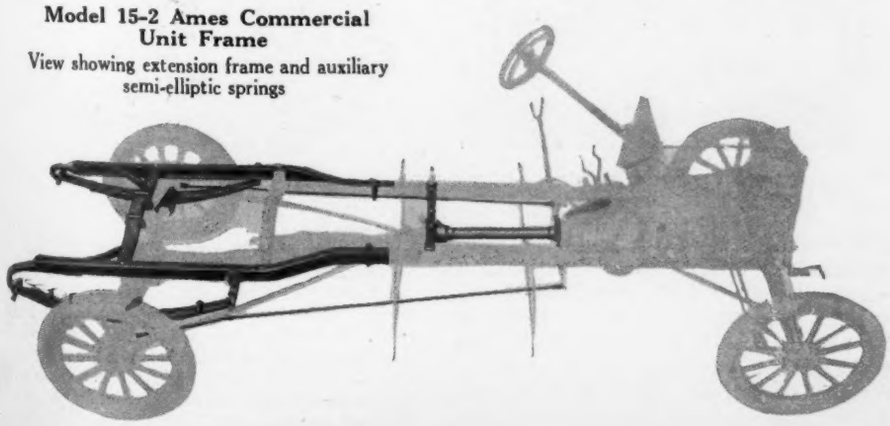
and attachment may be made to an ordinary lamp socket. The "Dumore," at 10,000 r.p.m. of the motor spindle and 30,000 r.p.m. of the internal attachment, gives a cutting speed that enables the wheels to clear themselves and enables the operator to maintain size. For internal grinding the grinder may be equipped with a long extension arm. This makes it especially suitable for regrinding cylinders, deep drawing dies, large gages, etc. This extension is a complete unit in itself and can be attached to the grinder in a few minutes. It is mounted on two S K F self-aligning bearings, and is connected to the engine shaft by a special lock bolt.

The machine is dynamically balanced and the engine and internal attachment are equipped with S. K. F. ball bearings. The weight of the grinder without this equipment is 17 lb. The regular equipment includes a set of seven elastic wheels, ranging from ⅜ to 4½ in. diameter, a cutter grinding rest, a cross-feed lever, six bolts, 10 ft. of reinforced cord, switch and attachment plug, all of which comes packed in a substantial wooden case.

THE AMES COMMERCIAL UNIT

The F. A. Ames Co., Owensburg, Ky., is offering six distinct models of commercial extension for Fords which attach to the regular chassis without drilling a hole. It gives a longer wheelbase for carrying a bulky load, a stiffer spring suspension and reinforces the Ford axle for carrying loads of 1500 lb. and up to 2000 lb. Model 15-2, illustrated, converts the Ford into a shaft-driven, 115-in. wheelbase truck, with a carrying capacity of ¾ ton up to a ton. The regular Ford chassis is reinforced by the auxiliary frame of the unit, which telescopes over the Ford chassis and spreads out rearwardly, giving a wider base for a commercial body foundation. The heavy-duty semi-elliptic springs are of 1500 lb. capacity and add this carrying strength to the Ford spring which is left on the rear axle. The regular axle is reinforced and strengthened by a solid steel truss rod of 5000 lb. tensile strength. Every model of the Ames unit is so constructed that it is guaranteed to stand up with a 2500-lb. load. There are only three parts to the entire unit—extension frame, springs and extension shaft, and the price is $97.50.

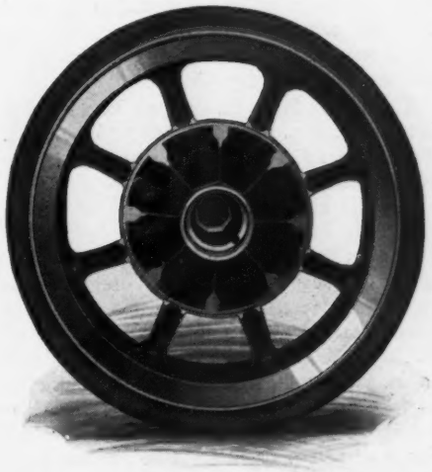
Model 15-2 Ames Commercial Unit Frame
View showing extension frame and auxiliary semi-elliptic springs



A TRUCK WHEEL COMBINING U-SHAPED SPOKES AND CONICAL HUB

A wheel rarely collapses from a full load when rolling over a road in the normal manner, unless it has been previously subjected to abnormal stresses and strains. Practically all wheels are destroyed by skidding stresses, when sliding against curbs, when sliding off the side of a sloping roadway or under circumstances which cause a severe stress directly against the outer face of the rim at the ground. The wheel, on the side opposite to the direction in which the vehicle is skidding, rarely breaks; because the stresses are very small, due to the tendency of the wheel to lift from the road and over the obstacle.

Because of these conditions, the Standard Steel Castings Co., Cleveland, O., has produced a wheel of special design with a view



The Standard Cast-Steel Wheel
This inside view shows the hollow construction of the spokes and the conical hub

of meeting the severe stresses due to skidding. The strength of the "Standard" cast steel wheel for a given weight is practically trebled by the adoption of the conical hub. The wheel is proportioned with regard to the physical nature of the material and by reason of its design, light uniform sections of steel are permissible, resulting in producing maximum strength for a minimum weight.

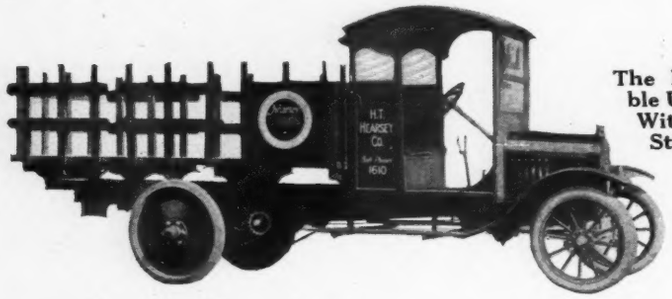
There is a minimum of metal at the neutral axis and the largest rounded sectional area is on the maximum tension side. The general design of the "Standard" wheel results in a strong, light and neat wheel, and one that is said to be lighter than a wood wheel of corresponding size.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

INDESTRUCTIBLE TRUCK UNIT

The Indestructible one-ton truck unit, manufactured by the Indestructible Wheel Co., Lebanon, Ind., is an auxiliary frame which parallels the Ford frame from the radiator to more than 5 ft. beyond the rear member of the present Ford frame, taking all the load and strain. The two frames are bolted together and the Ford rear axle is fastened to the truck frame and becomes the jack-shaft. This attachment is a standard truck frame and rear construction, and when attached to a Ford chassis the combination makes a one-ton truck. With a 7-to-1 gear reduction the Ford power plant is capable of handling capacity loads on steep grades and over soft roads.

High grade parts and accessories are used in the construction of this attachment. The unit has been designed to meet the requirements of business and manufacturing concerns that are in need of an efficient and reliable means of transportation around 2000 lb. capacity. All unnecessary parts have been eliminated, which has rendered this attachment very simple.



The Indestructible Unit Fitted With a Sided Stake Body

The frame is 14 ft. long, 32 in. wide and is made of 4-in. channel steel, 3-16 in. thick. The corners are reinforced with heavy gusset plates and the frame is provided with additional cross-members, which are fitted into the channel of the side members. The frame is hot riveted throughout. The springs are semi-elliptical, high-carbon steel, heat-treated and oil-tempered. They have eleven leaves 2 in. wide and are 48 in. long. The relief spring measures 2 x 30 in. and is mounted over the rear axle, to take care of overload and to relieve the tension on the side springs when traveling over rough or bad roads. When traveling light the load is carried by the side springs only, insuring a more resilient support of the load and easier riding. The emergency brake is the expanding type on the rear wheels, operated by a hand lever. The drums are 12 in. diameter and 3 in. wide. The foot brake is the regular Ford service. A 2¼ in., 35-45 per cent. carbon, forged steel, heat-treated axle is used, which is guaranteed to carry over 3000 lb. load. The bearings are 2 in. heavy duty Timken taper roller, which are adjustable.

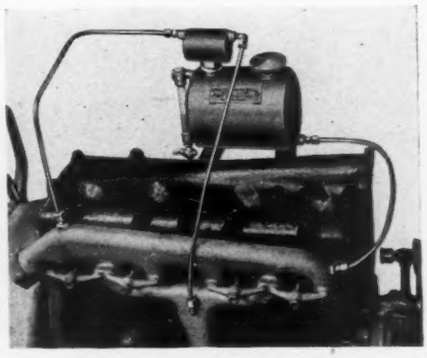
Chassis Unit

The sprockets on the jackshaft have 20 teeth and the rear sprockets 45 teeth. Machine cut Cullman sprockets and heavy duty, roller type Diamond chains are used. The chains have ⅝-in. rollers and 1¼ in. pitch. The radius rods are extra strong, of special design, connecting the combination axle casing and brake support with the jackshaft hanger on the frame. This construction relieves the springs of power-driving thrust and holds the rear axle in perfect alignment between the spring shackles. At one end the radius rod has an adjustable swivel to the jackshaft and at the other a swivel yoke fits over the rear axle, thus preventing twisting strain on the jackshaft and rear axle. The upright swivel joint allows it to move sidewise and gives flexibility. In this jointed radius rod construction there is ample compensation for shock and strain. The tires are 34 x 3½ in., solid rubber. The wheelbase is 126 in. when attached to the Ford chassis.

The tread is standard, 56 in. from center to center of wheels. The rear wheels of the Ford, with their ½-in. larger tires, are put on the front, otherwise the forward construction of the Ford remains unchanged. Indestructible pressed steel wheels 3½ x 34 in. diameter are used. These wheels are made of two plates of high-carbon, cold-rolled, deep-drawn steel, stamped true to gage and reamed to a driving fit over the hub centers. The rims are shrunk on hot and plates are riveted on each side to the rim. The price of the attachment is $350 f.o.b. Lebanon, Ind.

DEVICE FOR HEATING INTAKE MIXTURE

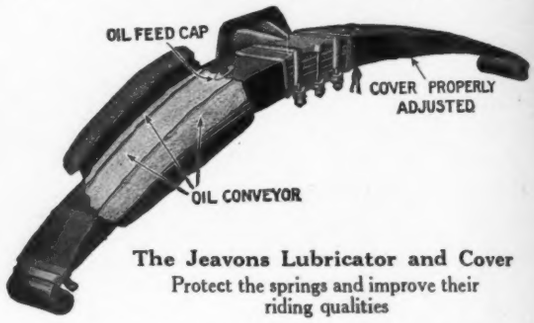
The Steam Motor Device Co., 1807-1809 Gratiot Avenue, Detroit, is marketing, through the H. V. W. Co., 3 Fountain St., N. W., Grand Rapids, Mich., a new device said to do away with carbon trouble and add efficiency to any engine. It consists of a tank and steam dome, attachable to any engine. Water from the tank is heated in the exhaust manifold and the steam rises to the dome from whence it is expelled into the intake manifold. There it mixes with the vaporized gas from the carburetor. The manufacturers say this process will create a saving of from 20 to 35 per cent. on gasoline or increase the mileage from 3 to 5 miles to the gal. One tank full of water is sufficient to supply steam for 100 miles. The device is made of brass and aluminum throughout. It is operated by a dash control. The price is $25.



Steam Motor Device Mounted Above a Ford Engine

SPRING LUBRICATOR AND COVERS

The lubricators and covers offered by the A. N. Jeavons Co., 896 Champlain Avenue, Cleveland, Ohio, protect the springs from dust, mud, water and slush and thoroughly lubricate the leaves. They are said to be a saving to every part of the car, particularly the tires, to which they are claimed to add many miles of service. They also prevent rust, eliminate spring squeaks and insure perfect spring resiliency. These Jeavon covers are fastened by a lacing on the underside of the spring. Through a cup conveniently placed oil passes to a set of wicks inside of the cover and next to the springs, thus assuring lubrication between the leaves of the entire spring. The oil is retained inside the cover, therefore the springs do not have a greasy or rusty appearance. The price is $1 per section, except for broken sets and trucks.



The Jeavons Lubricator and Cover
Protect the springs and improve their riding qualities

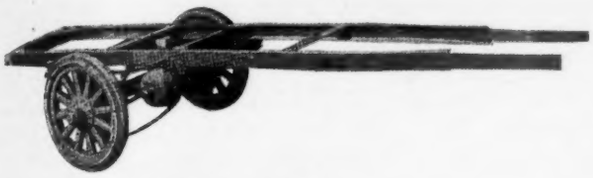
Portable Crane Hoist

The Keystone Garage Equipment Company, 201 Devonshire Street, Boston, Mass., is putting on the market this time-saving, portable crane hoist. It is of skeleton vanadium steel construction and moves on anti-friction roller bearing wheels. Thirteen styles and sizes are offered, ranging in capacity from one thousand to six thousand pounds.

Advertising appropriations bring greatest returns when expended in the CCJ

AUBURN CHASSIS ATTACHMENT

The Auburn Chassis Attachment Co., Auburn, Ind., is offering a unit selling for $325 which when attached to the chassis of a Ford, Maxwell or any small car chassis, completes a truck of one-ton capacity. It carries about 90 per cent. of the load and no extra strain is placed on the Ford chassis not originally intended. The makers claim these trucks are giving service on an average of free load capacity of 50 miles at $.75 expense.



The Auburn Truck Unit
The unit completely assembled ready to be attached

Specifications

Axles—2¼ x 1¾ in., fitted with high duty roller bearings.

Brakes—14 in. diameter x 2¼ in. wide, internal expanding.

Drive—Through double side chains, 1-in. pitch, ⅝ in. wide, ⅝ in. roller.

Frame—13 ft. 10 in. x 2 ft. 8 in. heavy gage rolled. 4-in. section and all brackets, hangers and gusset plates hot riveted.

Springs—2½ x 40 in., 9-leaf.

Wheels—32-in. artillery type, S. A. E. standard, twelve 2-in. spokes.

Tires—32 x 3½-in. solid rubber—highest grade.

Sprockets—Ratio 21 to 40.

Loading space—9 to 10 ft. or more back of driver's seat.

Wheelbase—When used with Ford, 128 in.

Tread—56 in. center to center, standard wagon truck.

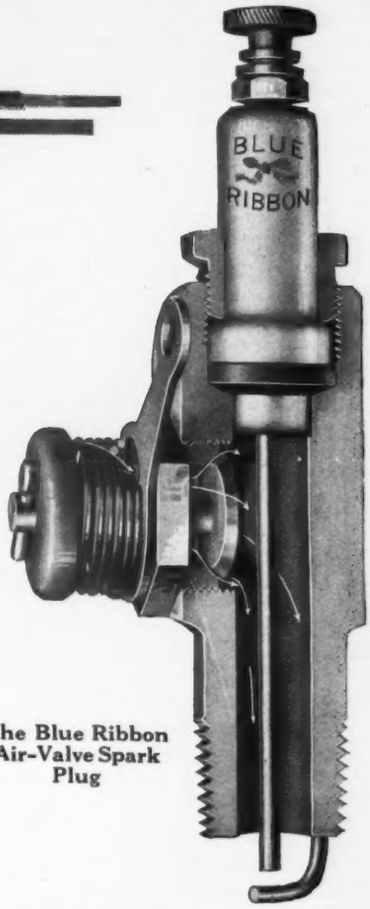
Weight—1000 lb.

Thermoid Brake-Lining Cabinet

Prominent in the group of "dealer helps" offered by the Thermoid Rubber Company, Trenton, N. J., is this substantial, attractive oak display cabinet. Dealers and garages that handle Thermoid hydraulic compressed brake lining may secure these cabinets in one of the two sizes, according to the number of rolls of Thermoid to be carried in stock. The company also supplies, free to the trade, window transfer signs and a variety of descriptive price lists.

AIR-VALVE SPARK PLUG

The International Spark Plug Co., Inc., Indianapolis, Ind., is introducing the "Blue Ribbon" automatic auxiliary air valve spark plug, which the makers claim has special features never before applied in spark plug construction. An automatic auxiliary air valve is fitted in the side of the spark plug, which automatically opens and closes with the working of the engine. Through a graduated inlet hole in the air valve cage, air is drawn in on the intake stroke of the engine, through the spark plug body into the combustion chamber, this air inlet being opened and closed by a lever attached to the valve cage.



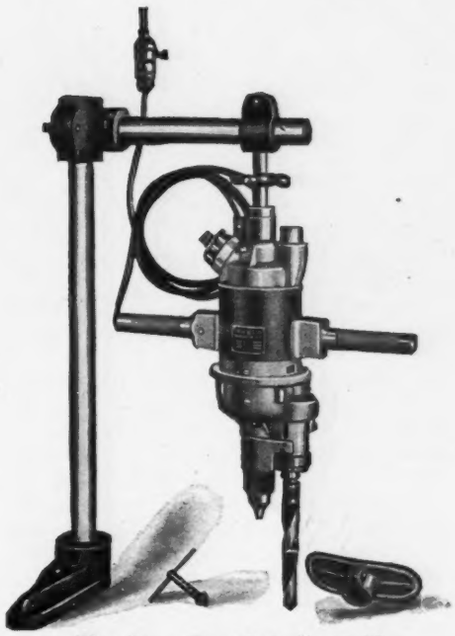
The Blue Ribbon Air-Valve Spark Plug

In installing a set of these spark plugs in an engine, the levers regulating the air are connected with the gasoline throttle and accelerator, being automatically controlled in this way, according to the gas supply and speed of the engine. It is claimed for this spark plug that it always insures perfect ignition, because the suction of air through the spark plug chamber keeps the passage and porcelain absolutely clear of all short-circuiting substances, and admits just the proper amount of air through the spark plug chamber to form a perfect mixture of gas, thereby not only increasing the power and efficiency of the engine, but at the same time showing a saving in gasoline consumption. It is likewise claimed that this plug eliminates oil pumping troubles and irregular firing in an engine.

Republic Rubber Co., Youngstown, Ohio, has increased its factory to treble its production of tires.

STOW HEAVY-DUTY DRILL

The Stow Mfg. Co., Binghamton, N. Y., is putting out a two-speed, two-spindle drill to furnish correct drilling speeds for tools within its range. In the spindles, drills from 1-16 in. to ¾ in. can be used and with the two spindles a greater working capacity is secured. The machine is fitted with a heavy-duty type of motor, extra heavy bearings and grease encased gears made of specially treated steel. The No. 1 or center spindle is fitted with a Jacobs chuck taking S. S. drills up to ½ in. and the speed is 450 r.p.m. The No. 2, or the offset spindle, is fitted with a Morse taper socket and takes M. T. drills up to ¾ in. and has a speed of 225 r.p.m. This tool is specially adapted for use in a small shop where not more than one tool of its kind is desired.



The Stow Two-Spindle Drill

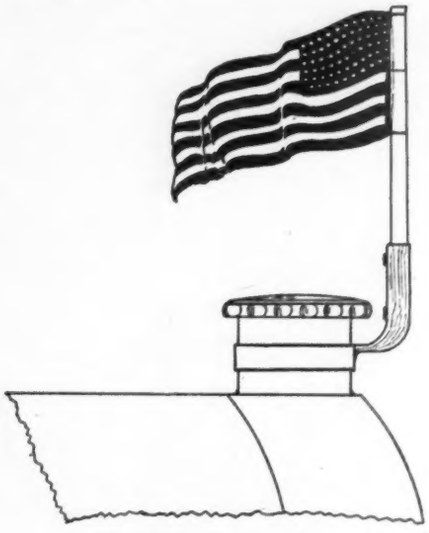
Specifications

Will drill in hard wood up to	1 in.
Will drill in metal up to	¾ in.
Capacity of chuck	½ in.
Capacity of Morse taper socket	¾ in.
Weight D.C.	26 lb.
Weight A.C.	27 lb.
Length over all D.C.	17½ in.
Length over all A.C.	17 in.
Diameter of frame	5¾ in.
Dimension of box for domestic shipment,	19 x 19½ x 8½ in.
Offset of spindles from edge of frame	2 and 3 in.
Speeds approximately	225 r.p.m.
Speed single phase	450 r.p.m.
Wound for 110 or 220 volts D.C. and single phase A.C.	

Smith Motor Truck Corp., manufacturers of the Smith-Form-a-Truck attachment, has opened a branch office at 905 Southwestern Life Bldg., Dallas, Texas. Tenison Bros. automobile department will continue as local distributors for the attachment.

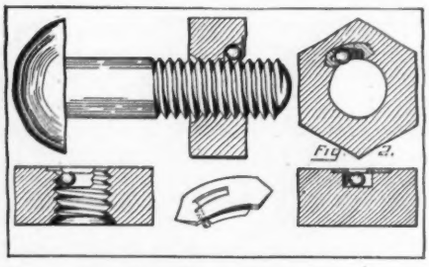
A NOVEL FLAG HOLDER

A novel flag holder for truck drivers desiring to show their patriotism by displaying the Stars and Stripes on their machines is being marketed by the Shattuck Mfg. Co., 98 Park Place, New York City. The holder is secured to the filler tube of



Shattuck Flag Holder

the radiator by a novel band arrangement which is securely locked in place by the fingers. This band is made adjustable to fit tubes of different diameter. One of the features of the design is that the flag holder proper can be set and locked in any desired position, which makes it adaptable to radiator fillers of varying design. The device will take flags with staffs up to and including ¼ in. diameter and does not interfere with the removal or replacement of the radiator cap when renewing the supply of water in the radiator. The Shattuck flag holder is light and strong, comes finished in black enamel, and retails at $.25.



The McGehee Lock Nut

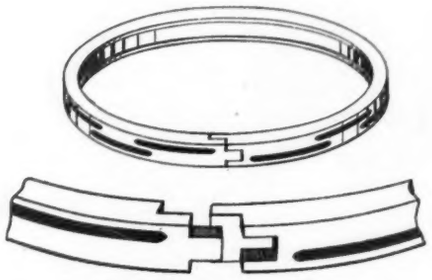
The drawings above represent different views of McGehee's lock nut, which is being distributed by R. Webb, Shreveport, La. The "lock" is in the nut itself, as shown in Fig. 2, and this lock is created by a depression (shallow at one terminus, deeper at the other), and the nut, in which a ball operates, communicating with and fitting in threads of the bolt. This insures safety, since the ball, rotating in the deeper depression, can only turn as the nut is screwed on, acting at the same time as a preventive of the unscrewing or loosening of the nut, since, when it is attempted to unscrew the nut, the ball, now transferred to the shallow part of the depression, locks the nut on the bolt. The principle of the device is that the longer and harder the use of the object in which the McGehee nut is used, the tighter and more secure the nut becomes.

HARWARD PISTON RING

The Harward Mfg. Co., 3939 Magnolia Avenue, St. Louis, Mo., after a series of tests and experiments with various types of piston rings, has developed a one-piece ring of unique construction.

The interlocking members of the joint engage in such a manner that no opening is said to occur in any direction through it, even when expanded to a worn cylinder. The idea in developing this joint was to get away from the long lap construction, thereby preventing the gumming oil and carbon between its members, from retarding the free and quick movement of the ring in expanding and contracting, to follow the varying diameter of the cylinder.

The eccentric groove around the inside surface of the ring gives the advantage of the plain eccentric ring without sacrificing any of the edge bearing surface. Two rows of separate oil pockets are cut into the out-



A One-Piece Piston Ring

Showing the interlocking joint, which is claimed to eliminate gumming oil and carbon between its members.

side surface for receiving and distributing excesses of oil, which would otherwise pass upward into the combustion chamber. The heavy film of oil retained in these pockets also helps secure high compression.

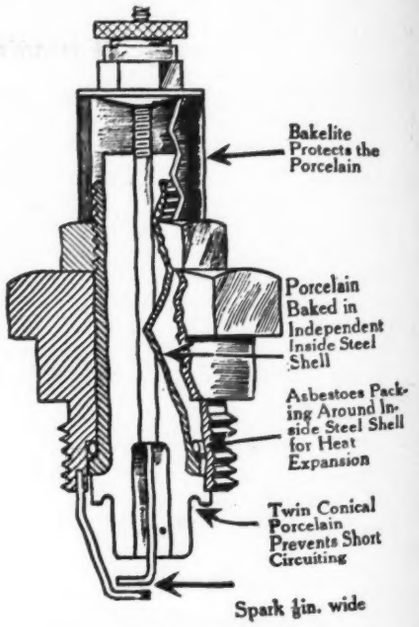
THE UNIVERSAL VALVE GRINDER

The Universal is a valve grinder which will reach all valves on an auto, including the rear valve on the Ford. The primary object in the construction of this tool was to procure something that would afford easy access to the rear valve of the Ford. However, its value is not confined to this make of car alone, for with its adjustable parts it can be fitted to any drilled valve. The tool is constructed on the brace and bit plan and operates on a universal joint which enables it to do its work at an angle as well as in the perpendicular position. The head is equipped with digits which are adjustable and can be tightened into the holes of any drilled valve. It has four points of contact, also adjustable, which in conjunction with the universal joint gives equal pressure and insures accuracy of work. The complete tool is made from special grade castings and drop forged. The price is $2, and the maker is the Universal Valve Grinder Co., Almond, Mich.

LA FRENCH SPARK PLUG

The La French Spark Plug Co., 1846 Broadway, New York City, is putting out a spark plug, characterized by its peculiar construction, which makes for power. The plug has an inner and an outer shell with an air space between. This arrangement, with the wires in parallel, produces a very hot blue spark from ⅛ to ¼ in. long.

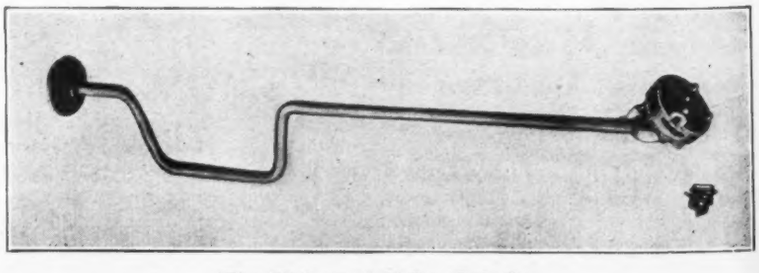
When the two wires are attached to a dynamo, and are parallel with each other, a flame from end to end is obtained, even if


Bakelite Protects the Porcelain
Porcelain Baked in Independent Inside Steel Shell
Asbestoes Packing Around Inside Steel Shell for Heat Expansion
Twin Conical Porcelain Prevents Short Circuiting
Spark ⅛in. wide

The La French Plug

Has porcelain baked inside of the independent steel shell

one is a foot or more over the other. However, if these wires are drawn toward each other, the flame would become shorter, until the wires touched end to end, when there is only a weak splutter. The La French plug sells for $1.



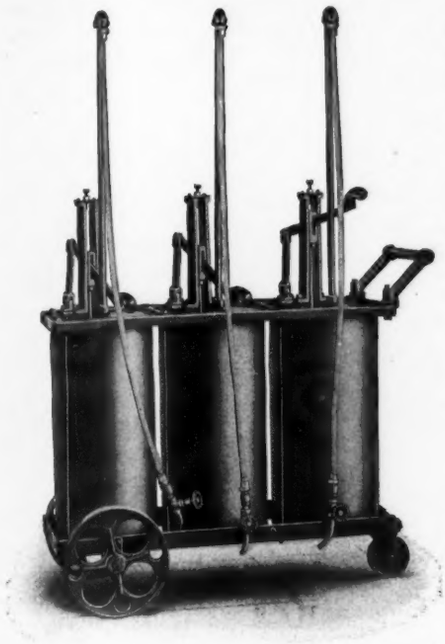
The Universal Valve Grinder

Will grind all valves, including the rear valve on the Ford

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

MANLY OIL SERVICE PUMP

The Manly portable oil service is practically the same service for oil as modern gasoline services are for gasoline. The service is kept at some central point in the garage is quickly pushed to the car, and



The Manly Oil Service

This three-tank service is the most popular type, as light, medium and heavy oil may be stored therein.

with one stroke of the pump a pint of oil is injected. This service unit is easily steered, it having a roller bearing castor under the handle. The wheels are large and have roller bearings so that the tank is easily and quickly rolled to a car. In each tank near the bottom is placed a self-measuring pump, the cylinder of which is cast iron, reamed true and smooth. The pump piston is also cast iron, grounded all over, and provided with one semi steel snap ring, similar to an engine piston. The pump has no leather washers, packing nor leather clapper valves. Each cylinder is suspended from the top or tank cover by three rods, and the piston rod connects with a lug pinned to the pump handle. This lug works between two guides, at the top of which is the stroke adjusting screw. The piston goes to the bottom of the cylinder on the down stroke and against the adjusting screw on the up stroke. Setting this screw up or down adjusts the stroke so that the pump can be accurately set to pump one pint.

The pump discharge connects with the stand pipe, at the top of which is fitted a flexible tube for conveying oil to the engine. At the end of the tube is a stop valve and bent nozzle to conveniently fit all engine oil openings. The top plate is one casting, and has a flange all around to catch any oil drip, which returns to the tank at the piston rod hole, the top of the casting draining here.

The tanks are round, made of heavy gage steel and are oil tight. They rest on an angle steel frame at the bottom of which are fastened the large wheels and caster. The top casting has a groove to fit over each tank and is packed with felt to prevent any possibility of oil splashing out. Eight bolts hold the top down on the tanks and clamp the steel frame together, making a rigid unit of the whole. In the top casting is a large hole over each tank for refilling the oil supply; closed by a pipe plug. The three-tank service is the most satisfactory, as it stores three grades of oil, such as light, medium and heavy. Each tank may be filled with the same oil or two tanks with one and the third with another grade, according to what oils are in greatest demand.

Each service is attractively painted in two colors, with an oil-proof carmine enamel above the top plate, below this dark green. The makers are the United Engine & Mfg. Co., Hanover, Pa.

Specifications

Tank—12 in. diameter by 24 in. high, capacity, 12 gals.

Pump—3 x 4 in., 1 pint per stroke.

Wheels—12 in. diameter by 1½ in. face.

Length of flexible tubing—4½ ft.

Overall Length—3-tank, 45 in.; 2-tank, 36 in.

Overall height to top of stand pipe—5 ft. 10 in.

Overall width over wheels—19 in.

Net weight—3-tank, 260 lb.; 2-tank, 190 lb.

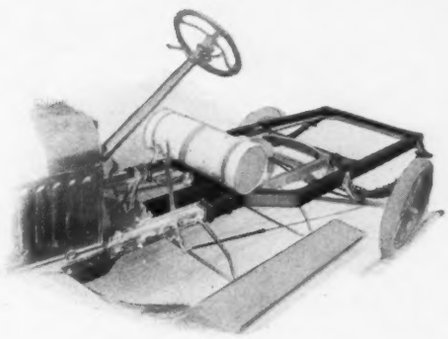
Craig Adjustable Screw Press

The 18 in. wheel and 4 pitch screw on this press, turned out by the Craig Engineering Company, 1011 Santa Fe Avenue, Los Angeles Cal., give such leverage that the extension lever is seldom needed. On a heavy job from one to four bars may be used, giving enormous pressure, about 50 tons maximum.

Specifications: Capacity, 30 tons pressure; height over all, 72 in.; floor space, 39 x 24 in.; shipping weight, 450 lbs.; price, as above, $70; price as above, except for 40 in. between uprights, $100.

THE UNITY TRUCK UNIT

The Unity truck attachment, which is being made by the Unity Motor Truck Co., Cleveland, Ohio, is said to meet the popular demand for a light 1250 lb. truck or delivery wagon that combines low first cost and economy of operation with speed. The Unity gives to the Ford the advantages of strength, increased carrying capacity and speed. Its frame is drilled so as to permit the quick attachment of the type of body required. The gear ratio remains the



The Unity Truck Attachment

same, 3.63 to 1, and the Unity construction puts no weight directly on the rear axle, but carries it on the Ford perch and housing which supports the spring shackles. The body is carried on semi-elliptic springs. While the rear axle is relieved of all weights it is strengthened and braced by two heavy steel rods that cradle the differential and assure perfect alignment of the rear axle and wheels. This feature of Unity construction tends to eliminate axle breakage.

To the Ford frame is bolted the pressed steel Unity frame, made of high grade steel. The Unity frame is 38 in. wide and 100 in. long, which makes the complete frame 150 in. long. This allows a body 38 in. wide by 7 ft. long back of the driver's seat without overhang. It adds 15 in. to the width of the frame and 48 in. to the working length. The Unity frame is rigidly fastened to the Ford frame by six clamps, which are secured to the side rails and rear cross member of the Ford frame. It is further reinforced by two cross members, one of which is clamped and bolted to the Ford frame. This makes the completed frame construction rigid and strong.

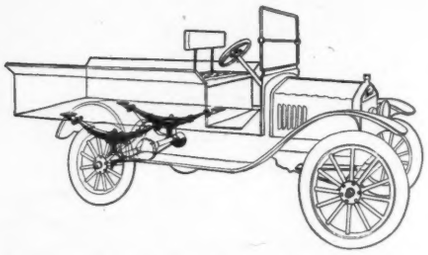
Two 50 in. Perfection springs are provided, together with the necessary spring hangers, etc. These springs are semi-elliptical, but are so designed as to give extremely easy riding. In the Unity the original Ford drive shaft is moved back intact. A new heat treated extension shaft enclosed in a torsion tube is furnished, together with a Hyatt roller bearing. The angle of drive from the universal joint to the differential is not changed. The design of the Unity extension shaft eliminates whip and is strong and compact. This feature gives the desired increase in length without decreasing the efficiency of the transmission.

Unity trucks are sold without bodies and the price of the attachment is $150, f.o.b. Cleveland, Ohio.

Everybody who is anybody in the truck industry reads the CCJ

STABLEFORD LIGHT TRUCK EQUIPMENT

The Ford chassis, when strengthened and stabilized by Stableford equipment, it is claimed, will give in commercial or light service practically the same standard of reliability, low up-keep and endurance that the Ford pleasure car now enjoys. In addition to strengthening and stabilizing the



Phantom View of a Ford Chassis Fitted With Stableford Equipment and an Open Express Body

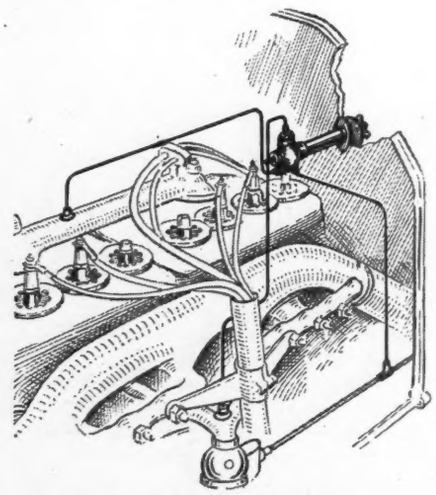
rear end of the chassis, the Stableford distributes the load more evenly and makes possible the use of a longer body. Without lengthening the chassis, bodies as long as 84 in. back of the seat can be safely used. The Stableford truck may be formed in a few hours' time, as it is not necessary to remove any Ford parts, except four nuts, or to bore any holes in the chassis.

Everything comes ready to fit, even to the body bolt holes in the frame. This equipment consists of two 44 in. semi-elliptic springs, cast steel rear axle, axle housing supports and a truss bar, and the only tool necessary to make the attachment is a wrench. Its weight complete is 78 lb. The Stableford Mfg. Co., 29 South La Salle St., Chicago, Ill., offers this attachment, the price of which is $50.

THE A-V-G GASOLINE PRIMER

The Cox Brass Mfg. Co., Albany, N. Y., is putting out a simple hand-operated combination gasoline primer, air accelerator and vaporizer. All operations are controlled from the dash, and the device is so constructed that it is immediately switched from one to the other by a twist of the wrist. All parts are built into the primer pump and connected to the engine by three ⅛ in. tubes. Only three connections need be made and all fittings are furnished. The primer introduces a small quantity of gasoline into the intake manifold in the form of a spray, thereby insuring an immediate start.

Combined with this gasoline primer is an auxiliary air valve, admitting air to the intake manifold above the carburetor for increasing speed and reducing gasoline consumption. The vaporizer or decarbonizer takes a small amount of water from the water manifold and injects it into the combustion chamber of the engine while running, as steam or vapor, which causes dissolution of the carbon deposits. Provision is made on the device so that with the air can be mixed a certain amount of vapor which will give a damp air mixture. The price is $7.50 complete.

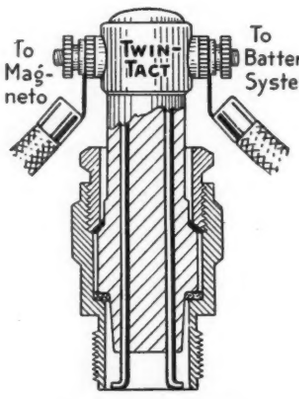


The A-V-G Attached

Showing it mounted on the dash with the three connections through eighth-inch tubes

TWIN-TACT SPARK PLUG

By the use of the Twin-Tact spark plug an automobile engine can be fitted with two entirely separate systems of ignition, even though there is provision for only one spark plug in each cylinder. The Twin-Tact spark



Two Plugs in One

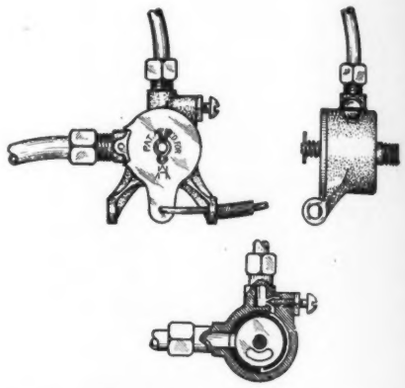
Twin Tact spark plugs are made in all standard sizes. They are not designed to produce two simultaneous sparks in each cylinder.

plug is really two plugs in one. It has two separate insulated sparking points, each of which is connected to its own separate insulated terminal post. Therefore, a spark can be obtained from either point. A magneto may be connected to one terminal post and a battery system to the other, and either system operated independently. The price is $1.50 each and they are manufactured by the Superior Motor Power Co., 26 Irving Place, New York City.

R. E. Olds, president of the Reo Motor Co., Lansing, Mich., is organizing a corporation to manufacture farm tractors in a new city which he is creating, located between Tampa and Oldsmar, Fla., at the head of Tampa Bay. The company is capitalized at $1,000,000 and will employ about 500 men at the start.

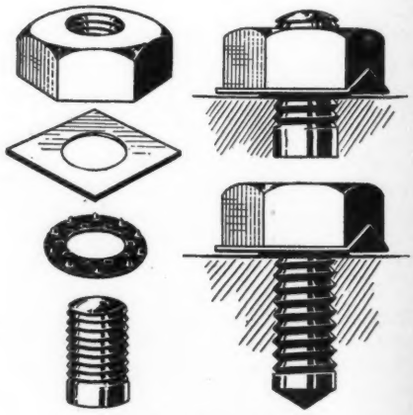
THE H-A MOISTURE CARBURETOR

The H-A moisture carburetor, a means for increasing gasoline mileage, is being manufactured in Denver, Colo., by the Hayes-Aderholt Mfg. Co. The carburetor proper is connected with the intake manifold. The water manifold is tapped and the water brought down through a 3-16 in. copper tube in the carburetor, where it is turned into steam or vapor. By hot air



Front, Side and Section Views of the H-A Moisture Carburetor

taken from around the exhaust manifold, the combined mixture is introduced into the intake manifold above the original gas carburetor through a 5-16 in. copper tube. The amount of water vaporized is regulated by a needle valve. On a series of tests in different altitudes, this carburetor is said to have shown increases in mileage ranging from 20 to 40 per cent. It is also claimed by the manufacturers to eliminate carbon.



Loxon Nut Locks

The Loxon nut lock, made by F. R. Blair & Company, Incorporated, 50 Church Street, New York City, both assembled and unassembled. This is not a nut lock washer, but a positive lock. It can be applied and locked very readily and can also be unlocked easily in difficult places. The Loxon nut lock may be used on steel, cast iron, brass, bronze, aluminum, etc., but should not be used on hardened steel. When applied, the washers and nut are put on in the order shown, the nut or cap screw tightened as far as it will go and a corner of the square washer bent up. In place of the regular square washers special shapes can be furnished for use in counterbored holes, against shoulders, etc.

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CHILTON TRACTOR JOURNAL

Playing Fair With the Tractor*

YOU have been listening to experts from factories, engineers who talked on the theory and details of tractor construction, while you might consider what I have to say more of a general nature, although I want to touch upon points that will be of interest, and I hope of service, to you in your work later on.

I want to take up what we mean by economical service and how much of it we have a right to expect, and then what we should do in return for this service. From reports which we have received at Purdue from tractor owners, we have found that the average life of a tractor ranges from 3,000 to 6,000 hours of actual work, or an average of 4,000 to 5,000 hours. That means ten hours a day for about fifty days in the year for eight or ten years. That is a good deal of service if you do your part. It depends upon what you buy and what you pay for it, because you pay for material, workmanship, construction and service.

Don't Wait for the Perfect Tractor

Perhaps a good many of you hesitate before you purchase, or if you consider the purchase of a tractor you say that you are going to wait a while, as tractors are not yet perfect. That is all right, but if you wait for a perfect tractor you may not be able to run it when you get it. The tractor at the present time is just about where the automobile was four years ago. It was not perfect then. You did not have the self-starting, self-lighting systems and a lot of other things which are now found upon an automobile. But was it a success, was it worth the money you paid for it? That is a question easily answered.

One of the troubles the manufacturer has to face at the present time is the fact that you do not know what you expect of a tractor until you get it. You are not just sure what you do want. How is the manufacturer going to know what to build? Consequently, if you wait for a tractor until they are perfect, you may wait a long while, but if the tractor gave good service nine years ago, just think what they should do at the present time. In considering the tractor, therefore, you are buying one for a certain amount of work, and in buying it you are assuming a certain obligation.

In buying a tractor, you should play fair with the manufacturer and with the tractor. If you buy a tractor for a certain number of plows, keep that number behind it, and no more. No matter if your tractor goes along easily with that number of plows, do not put any more on, because that will mean an overload. You have a right to expect the rated horsepower of a tractor and every tractor manufacturer must, of course, guarantee to you that it will pull so many pounds. That is the standard of horse power rating and that is all you have a right to expect it to pull. It may sound peculiar to some of you to consider horsepower of tractors in pounds pulled. At the same time, the rate at which the tractor travels has much to do with the number of pounds it can pull. For my own benefit and for the benefit of my students, I figured out the difference in pounds to be expected of a tractor when traveling at its normal speed on low and on high. From this reckoning it became very evident that the amount a tractor can pull depends upon how fast it is traveling. There is a certain definite rule that, for instance, if you have a tractor that will pull 3,000 lb. at 2 m.p.h., at 4 m.p.h. this tractor will pull just half that amount. Speed, therefore, is a vital factor.

The pull in pounds for a 12-in. plow bottom in Indiana runs around 300 to 500 lb. If you are considering a three-plow tractor, you will want one that will pull at least 1500 lb. or more. A tractor that will pull 1500 lb. is supposed to do this on level ground with good footing. Take for example an 8-16 tractor. This tractor traveling at 2 m.p.h. will pull 1500 lb.

Ground Should Determine the Equipment

Suppose this tractor is not working perfectly, or is traveling on rough ground, you can see why you have not the right to expect it to pull three plows in case it is supposed to pull only two. The thing to do in figuring out the size of tractor and the number of plows you want to use on your farm is to determine about what kind of soil you have to work with. If it requires five horses to pull an ordinary 16-in. plow, you know your ground is hard. The depth at which you wish to plow is also a factor. It is well to bear in mind that the average 14-in. plow is not constructed to plow deeper than 8 or 9 in. As a matter of fact, it will do its best work around 7 or 8 in., or about half the width in depth.

In considering these factors, I want you to understand that when you purchase a tractor you undertake a certain definite obligation. You can expect your tractor to pull a certain number of pounds, but you must not expect it to do more than that. To keep your tractor in condition, you must see that it develops the number of pounds which it is supposed to do, and in taking care of it with this definite aim in mind, here are the factors we must consider.

Speed Affects the Horse Power

We must remember that the speed of the engine affects the horsepower. The manufacturers of tractors designed them to make so many revolutions per minute. That means that your tractor will give you service and it will last and give its maximum amount of work at that speed. If the work is light, it might not hurt it to run a little slower, but it cannot run slower and carry its maximum load. To increase the speed means unnecessary wear and increased vibration. For these reasons it is best to make no changes in the normal speed of your tractor.

Satisfactory power depends upon the proper adjustment of the feeds of fuel. With an improper mixture of fuel, carbon forms inside the engine and there is a happy medium between too little fuel and too much fuel, at which the engine will do its best work. This can be found by a careful study of the machine when it is in operation.

Another point in getting satisfactory power is the timing of the spark. It is up to the tractor owner to know where the spark should be set for the best working condition. There is one best place for the ignition of the charge. A few degrees earlier or a few degrees later will affect the rated horsepower of a tractor much more than the average person realizes. In this connection, the magneto is not something that can be taken off and put back without endangering the adjustments. Unless the magneto is working properly, it is impossible to get correct ignition, and without correct ignition it is not possible to get the proper amount of power.

The proper timing of the intake and exhaust valves affect the horsepower. If it has been necessary for you to take valves out of your machines and you failed to get

*An address delivered by Professor A. H. Gilbert, of the Department of Farm Mechanics, Purdue University, before the International Harvester Tractor School at Indianapolis.

Opportunity comes to the well-informed. Read the CCJ

them adjusted properly in putting them back again, you will fail to get the proper amount of power. Here again there is a happy medium of adjustment in valve timing which should be studied carefully. There is one time when a valve is supposed to open and close for the best results.

Every time I see a railroad locomotive coming along, I can't help but think of what it is doing, what it is pulling, and how perfect mechanically it is constructed. The important point is that after it travels from 250 to 500 miles it is put in the roundhouse, where every part is gone over carefully.

Is that the way the average man handles his tractor? Did you ever stop to think that you may plow all day with your tractor, put it in the shed, then on the next morning you fill up your fuel tank and you start again? Keeping the fuel tank full and the oil tank full are not the only things you should do. You should go over the machine carefully, make sure that the bearings are all right, and see that each working part is well oiled.

Lubrication is important. The faster the machine runs, the more oil you must use. You should be careful to use the right grade of oil. The kind the manufacturer recommends is what every tractor owner should use in his machine.

The larger the tractor, the more points you have to consider if you want satisfactory power. If you wish to keep your engine speed up to its normal rate, keep your engine in time, both ignition and valves, use the proper mixture, and take care of lubrication. The final proposition is to take care against overloading your tractor. This should be prevented, and that is your business. The manufacturer guarantees you a pull of so many pounds for your machine, representing a certain amount of horsepower. Be careful that you do not overload your tractor.

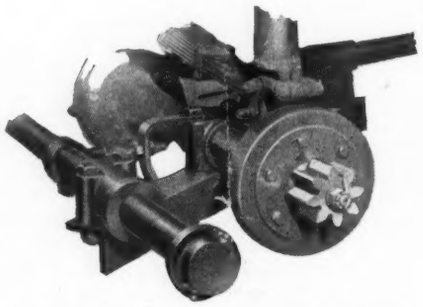
TIMKEN OPENS NEW TRACTOR DEPARTMENT

The Timken Roller Bearing Co., Canton, O., has just sent an announcement to the tractor trade stating that the company is now in a position to furnish Timken roller bearings for application in farm tractors. L. M. Klinedinst, manager of the new tractor department, states that for the past few years many tractor manufacturers have specified Timken bearings in laying out their farm tractor designs. In some cases this was because they had previous experience with Timken bearings in commercial and pleasure vehicles. But the demand made on the Timken plant for bearings for pleasure cars and motor trucks was so great at that time that it was impossible to make satisfactory deliveries to tractor manufacturers. Consequently they substituted other bearings until Timken bearings could be obtained. The recent large additions that have been made to the plant, which include the Timken cold drawn steel tube mill and the construction of the Timken steel mill, have now made it possible to establish a Tractor Bearing Department to supply this demand.

Tractor Rear End for Ford Cars

Conversion of the Ford car into a commercial car by a truck attachment has been accomplished in so many ways that it is no longer a novelty. But now comes on the market a device for converting the Ford into a tractor. It is so simple and quickly mountable or demountable that the Ford can be used for ploughing in the forenoon, for hauling a string of trailers into town in the afternoon, and as a touring car to take the young folks to a party in the evening.

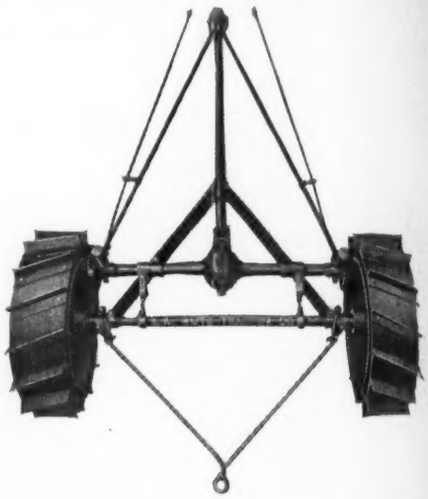
The tractor attachment is mounted by taking off the rear wheels and replacing them with spur gears. These drive the tractor wheels, which are mounted on a dead axle attached to the rear axle of the car by means of split brackets to the drive shaft housing. This gives a three point suspension as a means of support to the car. The power is obtained through a 30 to 1 gear reduction.



Rear Axle of the L. A. Auto Tractor

Showing Ford wheel replaced by spur gear, and attachment of dead axle to the rear axle of the Ford.

The tractor attachment is adapted to dual service purposes by demountable grousers on the tractor wheels, fitting it for pulling tillage implements. For road work, hauling trailers, these grousers may be removed or covered with special bands designed to prevent them from cutting the roads.



L. A. Tractor Attachment

The above illustration shows the device attached to the Ford rear axle. Note the clamps and dead axle for tractor wheels.

The wheels are 30 in. high, with a 10 in. face, making a 55 in. tread when assembled. The attachment weighs 710 lbs. Price $150 f.o.b. Los Angeles. Manufactured by Los Angeles Auto Tractor Co., 52nd St. and Santa Fe Ave., Los Angeles, Cal.

The L. A. Auto Tractor Hauling a Sixteen-Inch Disc Cultivator

The Ford car plus this device, which costs $150, gives a farm tractor capable of any work that horses can accomplish. The makers claim that the conversion from a pleasure car to a tractor can be made in about twenty minutes' time.

KANSAS PREPARING AGRICULTURAL WAR HELP

KANSAS is actively organizing for effective service in the meeting of the food problem likely to be brought about by the war. Dr. H. J. Waters, president of the Kansas State Agricultural College and head of the newly-organized Council of defense for Kansas, is planning for an intensive use of farm tractors in 24-hour day service and is equipped to start this as soon as searchlights can be applied to the tractors and mechanics found in sufficient numbers to operate them.

The Kansas City Tractor Club, Guy H. Hall, secretary, 1526 Grand Avenue, Kansas City, Mo., has printed half-page advertisements in the daily papers for tractor operators, calling attention to the necessity for tremendous quantities of bread and meat to meet the war demands and explaining that the Government has asked that mechanics be supplied to keep the farm tractors running day and night.

The following extracts from the advertisement are of interest:

"The Kansas City Tractor Club represents all the tractor interests in this section. Its members are eager to furnish the utmost in tractor service to the dealers and farmers of this territory, so that every acre can be utilized to capacity production.

"The Kansas City Tractor Club, at a meeting April 21, chose a delegate to the Missouri State Conservation Congress, to be held in Jefferson City April 23. In every other way that can be devised, this organization pledges its combined support to this movement.

"In addition to the enormous sale of tractors in the United States, there is a large and growing demand for American tractors for use on the farms of France and Russia. The agricultural experts of those countries, now Allies of the United States, realize that the tractor solves the war problem of a scarcity of farm labor. The tractor also saves and contributes to the Nation's food supply the grain that would be consumed by farm horses.

"Even now, the gravest problem that confronts the United States is a lack of labor on the farms. It must be taken for granted that after a year or two of war, this situation will be worse. Our government agricultural officials and members of the Council for National Defense realize this. Therefore they are urging that American tractors be kept at home and put to work on a 24-hour a day schedule."

The various tractor companies and sales agencies already maintain service stations in nearly every county in Kansas. It has been suggested that the functions of these be extended to make them trouble stations at which tractors of all makes may be repaired and maintained at maximum efficiency.

Last year more than 7000 motor car and tractor mechanics were graduated from Kansas City's motor training schools and more than 1000 students now are enrolled in these institutions.

Everything possible is being done to insure a big acreage of all spring crops, and power is the principal need in western Kansas, where the wheat crop has been destroyed. A year ago thousands of horses were shipped from that section to Europe and there is a shortage of farm power to plow and seed the available land. The bankers and farmers are co-operating to get tractor outfits wherever possible to handle them. Men with tractors are being invited to come into that section and make a good profit. Canvasses are being made of the farmers to find out their farm capacities and what they need in the way of seed, power and labor to farm their land.

The Curtis Form-A-Tractor

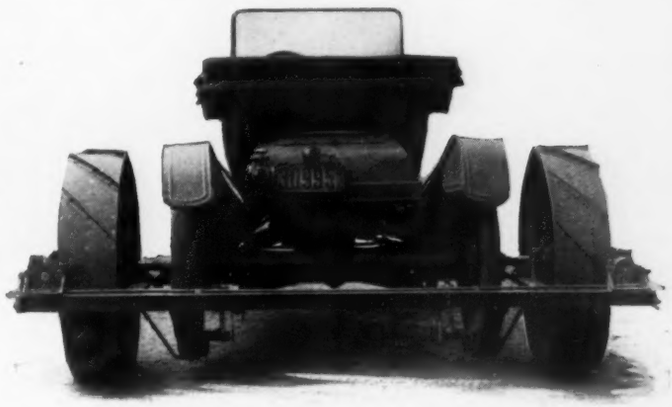
The Curtis-Form-A-Tractor Co., of Chicago, has announced its tractor attachment that converts any auto—not just a Ford—into a practical tractor adaptable for all-around service in field or at the belt. It does practically everything that a heavy duty tractor will do—in all soil and weather conditions—both day and night. Its weight is 1000 lb., its cost $350 f.o.b. factory. The manufacturers of the Curtis-Form-A-Tractor state that it attaches to any auto in three minutes and can be detached in one. There is nothing to remove in attaching, not even a wheel, a bolt or a hub-cap. The auto is backed into the Curtis, a patented device locks the wheels, the underframe is attached to the front axle—and away the farmer goes—ready for real tractor work.

One can plow, disc or harrow, pulling from two to seven plows and accomplishing more than six horses and three men. With the Curtis-Form-A-Tractor and a triple gang plow more can be accomplished in one day than four men, four plows and eight horses. It starts on high and runs on high. There is no shifting gears, no strain on the differential.

Never, at any time, does the engine exceed the speed of 1000 r.p.m. or 20 m.p.h. At all times there is plenty of reserve power. Its high speed is converted by the reducing gears on the tractor into pulling power equivalent to twelve times that of the ordinary auto.

A giant exhaust fan, similar in construction to the fans used on the motor trucks on the battle front in Europe, drives a current of cold air through the radiator at a high rate, greatly assisting cooling.

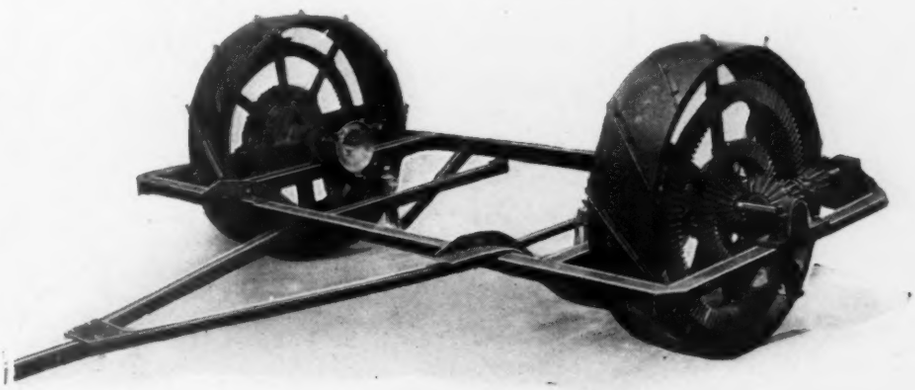
When ready for belt work gears are thrown into neutral, the belt is slipped on the pulley, and in a short time it is running the corn sheller, ensilage cutter, feed grinder, or whatever belt work there is to be done.



Attached to a Ford

The Curtis Form-A-Tractor is shown attached, the belt drive being removed. The car rides on two jacks.

WILLYS-OVERLAND Co., Toledo, O., has contracted with the Curtiss Aeroplane Co. to manufacture for the U. S. Government 4500 Curtiss aeroplane engines. The production of Willys-Overland automobiles will not be interfered with in any way by the manufacture of these engines.



The Curtis Form-A-Tractor Unit

The weight of this unit is one thousand pounds. It is built of steel and equipped with roller bearings.

All phases of the truck industry covered best in the CCJ

The Tom Thumb Track-Laying Tractor

A SELF-LAYING endless track type tractor is being manufactured by the Tom Thumb Tractor Co., of 30th Avenue, S. E., Minneapolis, Minn. It is known as the Tom Thumb Tractor, and is offered in one model, which develops 12 h.p. on the drawbar and 20 h.p. on the belt. Investigation by the company's engineers into the traction needs of the farmer has led to the use of the endless track system, which in this case is simply built and almost frictionless. This track has proved to produce good results in all conditions of the soil—sand or marshy ground.

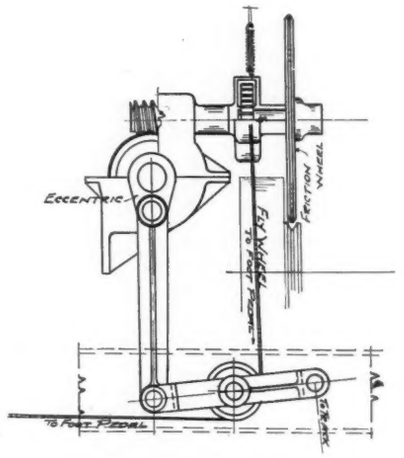
The front wheels are easily and quickly adjustable for height. When plowing one wheel is raised half the depth of the furrow; the other is lowered the same distance; the front end of the track is raised half the depth of the furrow. In this way, the wheel which runs in the furrow acts as a guide and is flat on the bottom, the land wheel is flat on the ground and the track secures its maximum surface contact. To turn machine at end of field no further adjustment is necessary. With the plows out of the ground ample traction is secured by rear end of truck.

The track is built flexible one way and rigid the other, that is, in running over a protruding obstruction, it will not give or bend upward, but will readily flex in passing around the gear wheels. It has no pins, links or hinges, and all joints are rolling contact. The castings used in it are of special alloyed steel combining unusual strength and wearing qualities. Any section of the track can be replaced in a few minutes by the removal of four bolts. The track axles run on Hyatt roller bearings and have oil well lubrication.

The engine is a Waukesha, 4-cylinder, bore 4¼ in., stroke 5¾ in., speed 800 r.p.m. The Dixie magneto is used. It is high tension type with impulse starter.

Gears are machine cut, enclosed and run in oil. The gasoline tank is of 20-gage steel, capacity 20 gal. A large honeycomb type of radiator is used. The speed is 2.7 m.p.h. on high and 2.1 on low.

All parts of the transmission are quickly accessible for inspection. The entire transmission, including the final chain drive, is enclosed and operates in oil. The steering wheels are 42 x 8 x ⅜ in. Spokes are forged into the hub and riveted against a flange to the rim.



Power Track Lift

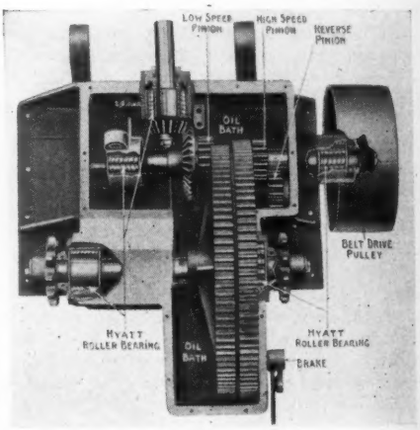
The V-shaped friction wheel is drawn against the flywheel when the controlling pedal is depressed. Then through the worm-gear reduction and eccentric the track is raised or lowered.

The track lift device is operated by foot pedal convenient to operator. A V-shaped friction drive pulled against tension spring engages flywheel, and by worm gear reduction (enclosed and running in oil bath) raises and lowers end of track.

It locks at any point by releasing pressure on the foot pedal. The extreme travel is 5 in., and the time required is 3 seconds from extreme to extreme. The machine can be turned in a 15-ft. circle.

The carburetor is fitted with an air cleaner to keep grit and dust from the engine. The brake is of the expanding shoe type, engaging with the inside rim of the large gear. It is controlled by a pedal with a ratchet lock. The price of the machine is $985 f.o.b. factory.

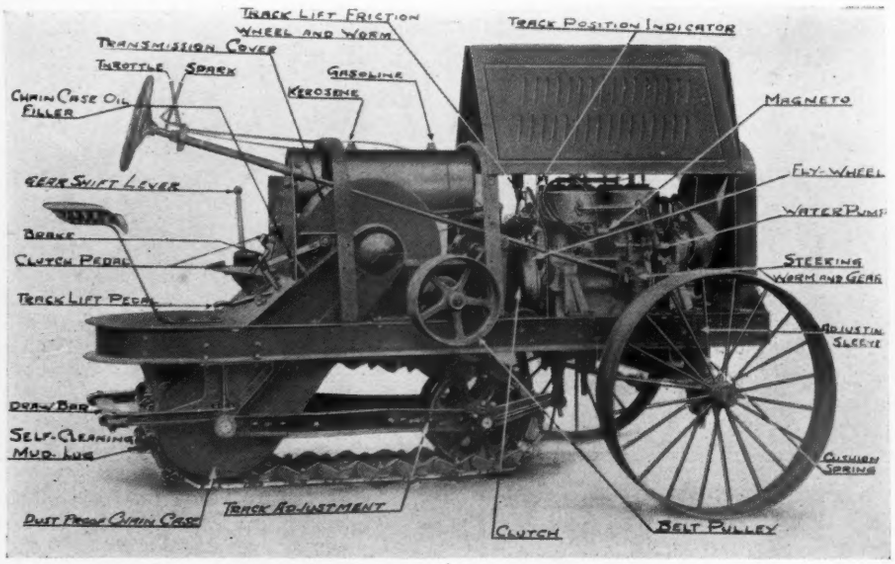
The "Tom Thumb" is useful every day in the year and is capable of making its owner a profit in any field, regardless of soil or weather conditions, its usefulness not being dependent on favorable conditions of soil or weather. It is not a substitute for horses, sometimes, but actually replaces them, doing their work cheaper, quicker and better. The "Tom Thumb" has unusual advantages where a capacity of from 6 to 10 horses is required, whether the work consists of plowing, discing, harrowing, seeding or harvesting.



Sectional View of the Transmission

All gear shafts have four splines, tooled out, giving strength, with quick assembling and demounting. The transmission and the final drive chain as well are enclosed and run in oil. Hyatt roller bearings are used.

Within the limits of its rated belt capacity it is unequalled for use with corn shellers, fodder shredders, feed grinders, silo fillers, small grain separators and such other belt work as is usually found on the average farm.



Side View of the Tom Thumb Tractor

The front end of the track is raised when turning about. As is shown, the gearshift, spark and gas levers, and the clutch, brake and track-raising pedals are all conveniently located to the operator

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SERVICE MANAGERS' ASSOCIATION, Chicago, Ill., has been formed to co-operate in working out a uniform and equitable service policy that will work to the advantage of both the owner and the dealer. The officers of the new association are: E. M. Lubeck, Louis Geyler Co., president; James Winterfelt, Winton Co., vice-president; R. A. Decker, Harry Newman Co., treasurer, and John Weyrauch, Mitchell Motor Co.

Advertising in the CCJ is memory insurance "Out of sight, out of mind," you know

The Albaugh-Dover 15-30 "Square-Turn" Tractor

UNDOUBTEDLY the feature of this tractor is the patented friction drive. This drive or transmission makes possible the turning about of the tractor in its length, commonly called making a "square turn." This tractor is manufactured by the Albaugh-Dover Co., of Marshall Blvd. and 21st Street, Chicago. Some of the other features of this machine are the Waukesha engine, Bennett carburetor and Dixie magneto. The price of the tractor is $1285 f.o.b. Chicago, Ill., or Norfolk, Neb. With a 3-bottom gang attached and ready for use the price is $1385.

The transmission consists of a double cone and disc arrangement, which permits of driving both wheels forward, both wheels backward, or one wheel forward and the other backward, or one idle and the other either forward or backward. It is this unusual flexibility which enables the operator to make a square turn, and also to lift the plows from the ground, turn a square, clean corner and set the plows in the ground again in but few seconds.

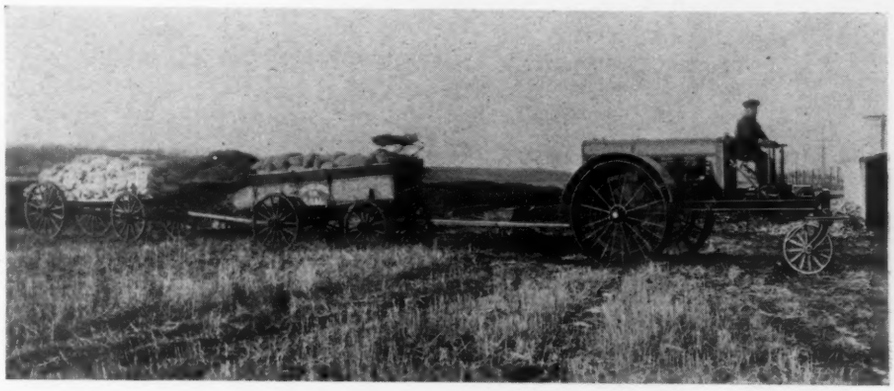
The mechanical construction of this "Giant Grip" drive is extremely simple, having only three parts. A shaft driven direct off the engine carries two fixed fibre faced cones. Two large gray iron bevels are mounted on eccentric shafts so that a slight shift in either direction wedges the bevel face against one of the revolving cones, delivering the full power of the engine directly to the corresponding drive wheel. In this way the operator is able by the simple shifting of two levers to apply power to either one or both wheels forward or backward or to one forward and the other backward at the same time. This enables the operator to turn the tractor around in its own length and to travel in either direction at full speed and power. It also does away with clutch, differential and transmission gears. In reality, eight separate and distinct movements are possible with this transmission. These are: 1st, right wheel forward; 2nd, left wheel forward; 3rd, both wheels forward; 4th, right wheel reversed; 5th, left wheel reversed; 6th, both wheels reversed; 7th, right wheel forward and left wheel reversed for quick, short turn to the right; 8th, left wheel forward and right wheel reversed for quick, short turn to the left. The operator has only to remember that the movement forward or backward of either power lever applies power forward or reverse in the corresponding drive wheel. He has no clutch to operate, no transmission gears to shift. Driving this tractor is as simple as driving a team.

The Waukesha engine is of the heavy-duty type and designed for tractor use only. It has four cylinders, bore 4¾ in., stroke 6¾ in., and develops 15 h.p. on the drawbar and 30 h.p. on the belt. The carburetor is a Bennett combination kerosene and gasoline, and it is equipped with a fuel heating device. The fuel can be changed at will. The latest Dixie high tension magneto is used with a Sumter impulse starter.

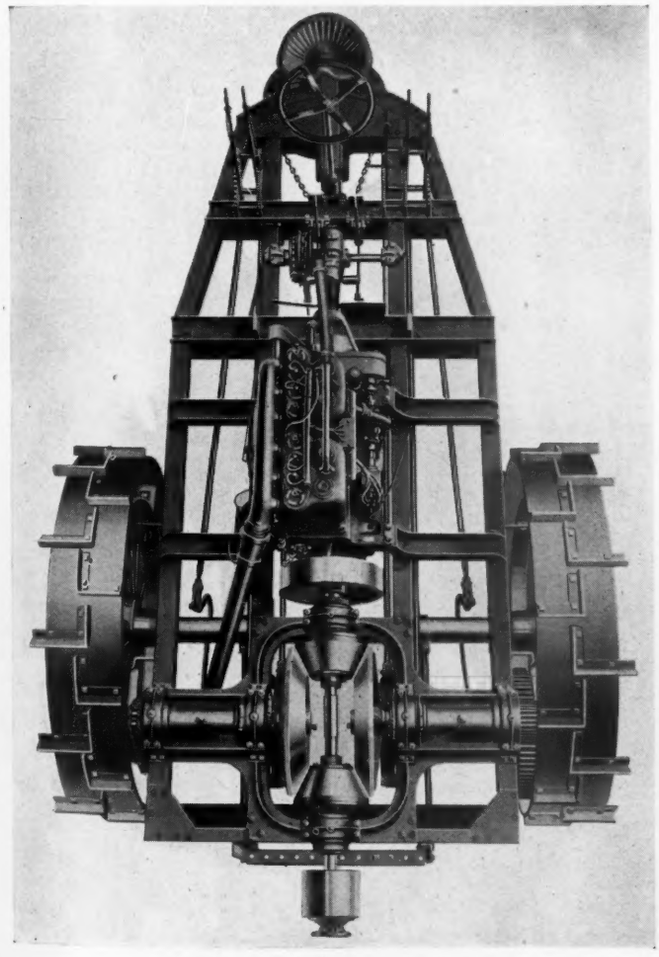
Tractor wheels are 62 x 12 in., have 24 spokes and are equipped with Albaugh-Dover all-purpose lugs. The frame is of steel, 5 in. channel section. It is reinforced by the heavy cast axle housing, and the corners as well are reinforced. The speed is 2½ to 3 m.p.h. in the field and 4 m.p.h. on the road. Steering is done by hand or power, probably 90 per cent. being done by the latter. The weight is 6500 lbs.

Any standard 3-plow gang may be used with this tractor and no extra attachments are needed. Pin-break plows furnished if desired for use where stones or stumps bother. The Albaugh-Dover power hoist for plows is operated by the engine, whether the tractor is traveling or running idle.

The special friction clutch pulley is operated directly off the crankshaft of engine and is most conveniently placed for quick setting and satisfactory work.



Hauling Two Hundred Sacks of Cement Across Fields With an Albaugh-Dover Square Turn



Top View of Albaugh-Dover

This is known as the 15–30 Square Turn Tractor, and is shown with the radiator, hoods, fenders and fuel tanks removed to show the power plant and driving mechanism.

McQUAY-NORRIS MFG. Co., St. Louis, Mo., has added the following men to its sales force. These men are mechanics and are graduate engineers, and will cover the following territory: J. H. Bishop will travel out of the Kansas City branch office; G. T. Parsons and P. T. Egbert, out of the New York branch office; Arthur F. Frost, out of Dallas, Tex.; J. H. Griffith, out of Pittsburgh, Pa.; George Geidenriech, out of Cincinnati, Ohio.

Merit wins—that's why the CCJ is the leader

La Crosse "Happy Farmer" Tractors Models A and B

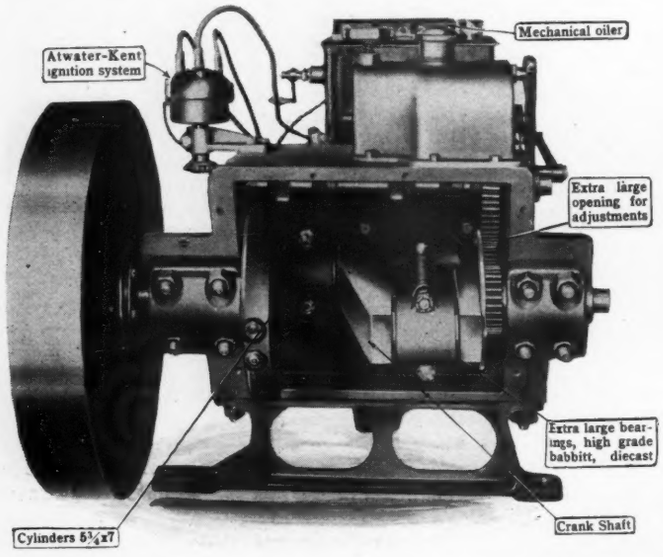
THE La Crosse Tractor Co., of La Crosse, Wis., is manufacturing the Happy Farmer tractors in two models, namely, "A" and "B." Model "A," 8-16 h.p., uses gasoline for fuel, but is supplied with a kerosene attachment for $15 extra. The price of this model is $585, f.o.b. factory. The tractor model. Ignition is by the Atwater-Kent system. Lubrication is by sight and force feed.

The transmission gears are cut steel, and are enclosed, and an expanding wood shoe clutch is used. The main drive gear is of steel, made in four sections, interchangeable. Bull pinions are of the roller cage type. The brake is connected with the clutch lever. The tractor is controlled by two levers, the clutch and the reverse, throttling being automatic.

The fuel capacity is 9 gal., cooling system capacity 8 gal. The belt pulley is 6 x 11 in. The overall length of the tractor is 152½ in., width 72 in. The driving wheels are 56 x 10 in.; the steering wheel is 31 in. in diameter.

The engine of this model is larger, being 5¾ x 7 in. The main bearings are larger as well, size 2½ x 5½ in. The valves in this model are located in the head, the diameter of each being 2⅝ in. A special kerosene carburetor is furnished as regular equipment. Model "B" also carries 11 gal. of kerosene and 2 gal. of gasoline. The cooling system capacity is greater, namely, 9 gal. The clutch is of the contracting band type.

The details in the preceding paragraph are the main points wherein the Model "B" differs from Model "A."



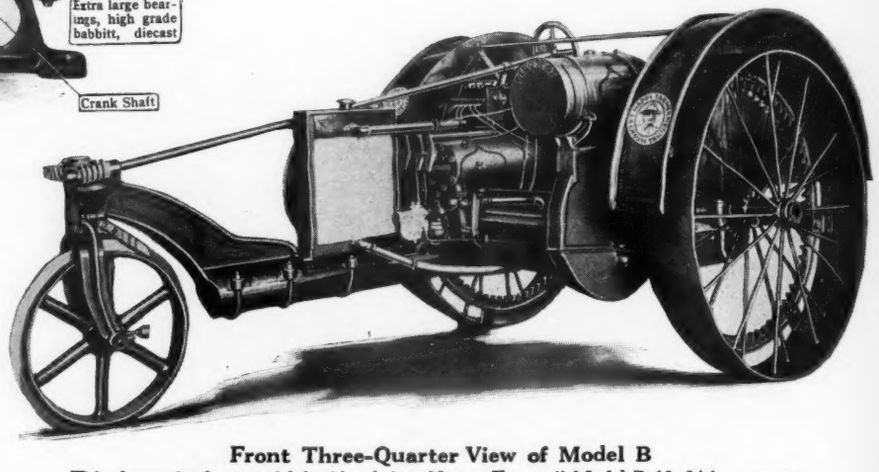
Engine Accessibility

Showing the rear of the engine with the rear half of the crankcase removed. The inspection plate (not shown) can be removed while the engine is running, simply by unscrewing two thumbscrews.

Model "B," 12-24 h.p., uses kerosene or distillate, and sells for $735, f.o.b. factory. Both models are equipped with carburetor air cleaners. The models resemble each other rather closely. They have two rear drive wheels, the single front wheel doing the steering. Model "A" is capable of delivering 1500 lbs. constant drawbar pull at about 2¼ m.p.h., and 16 h.p. on the belt at 750 r.p.m. The Model "B" under similar conditions will deliver 2000 lbs. drawbar pull at about 2¾ m.p.h. and 24 h.p. on the belt. The Model "A" weighs 3500 lbs. and 88 per cent. of this rests on the drive wheels. It will pull two 14 in. plows at an average depth of 7 in. in practically any kind and condition of soil. The model "B" weighs 3700 lbs. and is guaranteed to pull three 14 in. plow bottoms in practically any soil.

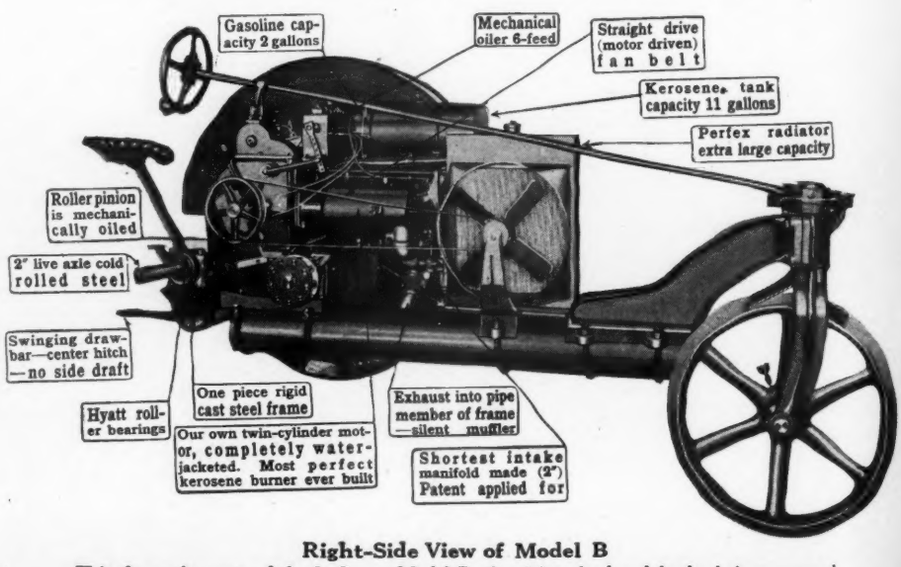
The engine in the Model "A" is a two-cylinder, horizontal type, bore 5 in., stroke 6½ in. Cylinders are cast in block, "L"-head. The engine has four-point suspension and is equipped with a flyball governor. The crankshaft is drop forged of high carbon steel, heat treated. Bearings are die cast babbitt, easily removed or adjusted. Each of the two main bearings is 2¼ x 4¼ in. The steel piston pin is hollow, hardened and ground. Connecting-rods are drop-forged, "I"-beam section, of carbon steel.

The engine is water cooled, water being circulated by a centrifugal pump. The radiator is mounted on the frame extension and a fan, driven from a pulley on the engine shaft, directs air against the radiator. The carburetor is a Bennett, special



Front Three-Quarter View of Model B

This shows the front and left side of the "Happy Farmer" Model B 12–24 h.p. tractor


Gasoline capacity 2 gallons
Mechanical oiler 6-feed
Straight drive (motor driven) fan belt
Kerosene tank capacity 11 gallons
Perfex radiator extra large capacity
Roller pinion is mechanically oiled
2" live axle cold rolled steel
Swinging drawbar—center hitch —no side draft
Hyatt roller bearings
One piece rigid cast steel frame
Our own twin-cylinder motor, completely water-jacketed. Most perfect kerosene burner ever built
Exhaust into pipe member of frame —silent muffler
Shortest intake manifold made (2") Patent applied for

Right-Side View of Model B

This shows the parts of the LaCrosse Model B, the right wheel and fender being removed

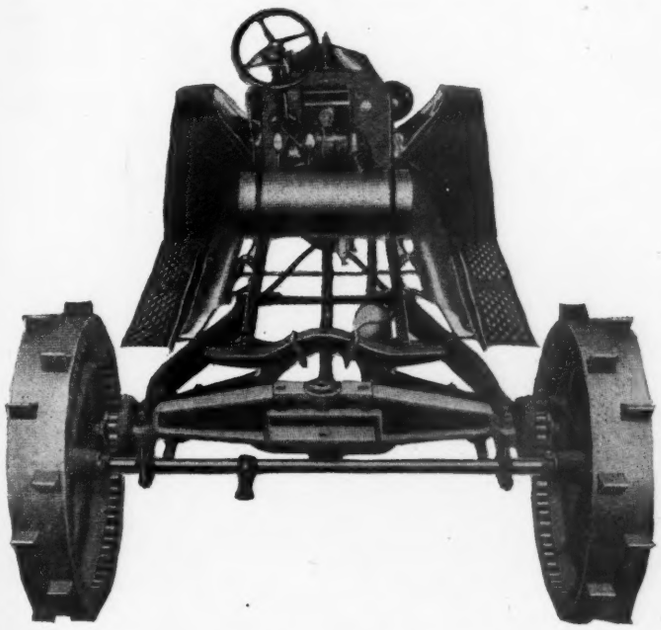
THE STAUDE MAK-A-TRACTOR

The E. G. Staude Co., St. Paul, Minn., is making an attachment for converting Ford automobiles for tractor purposes, called Staude Mak-A-Tractor. It is a channel iron frame which clamps to the Ford frame midway between the rear and front seats, and is secured to the Ford axle by two wide sleeves. The tractor wheels are 38 in. diameter by 8½ in. wide, and are operated by a ball gear and driving pinions, the driving pinions replacing the Ford rear wheels in the conversion. Also with this tractor attachment is furnished a special Ford radiator, much more efficient for this line of work than the regular Ford radiator would be, and a patented force feed oiling system which pumps oil directly from the reservoir in the clutch housing to the engine bearings through a sight feed on the dash. The radiator and oiling system become permanent parts of the Ford and in no way alter its general appearance, but add to smooth engine running and efficient oiling and cooling.

After installing these parts, all that is necessary to change the Ford from a touring car to a tractor is to put on the pinions, the tractor wheels and the special tractor axle. This operation is reversed when it is desired to change the tractor back to a touring car. The Staude Mak-A-Tractor can be used in plowing, rolling, hauling, pulling binders, drilling, and, in fact, anything in the cultivating and farming line.

The tractor wheels are cast of one piece of semi-steel and are drilled with holes to take the fastener bolts of the Staude concave creepers. The hub and spokes of the wheels are exceptionally strong, and the wheel itself is reinforced by a heavy rib on the inside. The bull ring gear which takes the driving power from the driving pinions is bolted to the inside of the tractor wheel at the rim in such a manner that the driving power is applied at the edge of the tractor wheel. This type of construction gives maximum application of power and a minimum of strain on the working mechanism itself. The gear teeth on the bull ring gears are so designed that they are self-cleaning. The Staude driving pinion is integral with the brake drum which replaces the brake drum of the Ford rear wheels when the rear wheels are removed and the Staude Mak-A-Tractor attachment is installed. The driving pinion's rollers are made of nickel steel, running on chrome nickel steel pins which afford great resistance to wear. The pins do not turn, the rollers turn them.

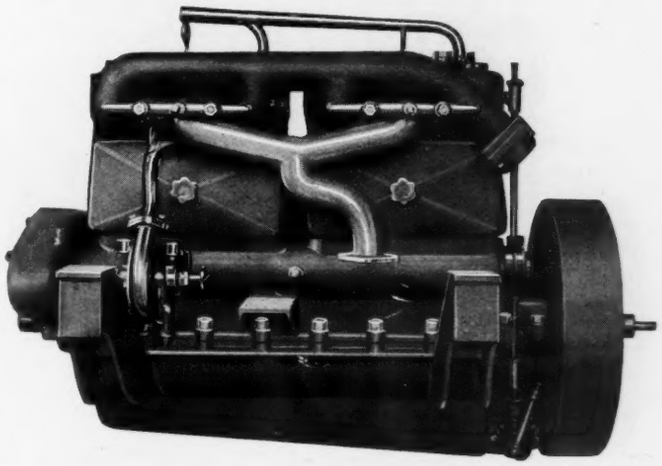
Eighteen 4 in. high, concave creepers are furnished for each tractor wheel which give a sharp cutting edge for digging into the soil and giving greater pulling strength. The Staude rear axle is 2 in. diameter and is of cold-rolled steel. This special axle carries the weight of the Ford and is also the member on which the pulling strain is put. A special fifth wheel attachment for receiving the ordinary farm wagon bolster and reach is furnished at slight additional cost. Changing the size of the roller pinion gives speeds ranging from 2½ to 5 m.p.h., the hauling speed. The engine speed is never more than 1000 r.p.m., the same speed as that when the touring car is making 20 m.p.h. The price, complete, of the attachment, is $195 f.o.b. St. Paul, Minn.



The Staude Mak-a-Tractor
Showing method of attachment; also fifth wheel for heavy hauling.

BUFFALO TRACTOR ENGINES

The Buffalo Gasoline Motor Co., of 1280-90 Niagara St., Buffalo, N. Y., is manufacturing engines of two, four and six cylinders, adapted for very heavy commercial car or tractor work. Buffalo engines have been in use for several years upon large farms in the west. They are designed especially for the hard work concomitant their use with the farm tractor.



Valve Side of Four Cylinder
This model has a bore of 5 in., and a stroke of 6 in.; cylinders cast in pairs, and force feed and splash lubrication.

The four cylinder models are made in the following sizes: 5 x 6 in., 5 x 6½ in., 6 x 7½ in., and 7½ x 9 in. A two-cylinder model 5½ x 7 in. and a six-cylinder 7½ x 9 in. are also made.

The 5 x 6 Inch Four-Cylinder Model

The four-cylinder Buffalo model with 5-in. bore and 6-in. stroke has a speed of from 500-1000 r.p.m. It has been used extensively as a truck engine, but is also adapted to the needs of tractor work.

The weight with aluminum base and crank chamber is 825 lb. and with iron base and crank chamber 1100 lb. It is completely enclosed, easily accessible and sturdily built. The cylinders are cast in pairs from close grained special alloy iron, machined, heat treated, finish machined water tested. The cylinder water jackets are fitted with large handhole plates for cleaning, the water being circulated by means of bronze centrifugal pump.

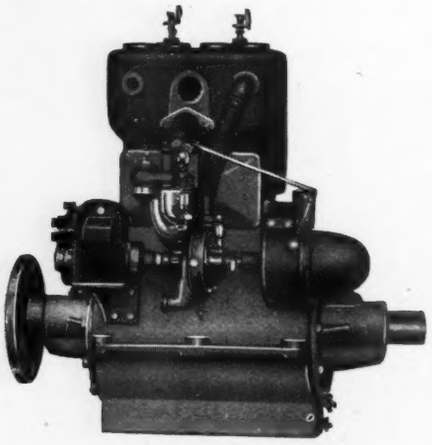
Lubrication is by means of a splash and stream feed system, the oil pump forcing oil from a reservoir contained in the subbase. All valves and valve springs are enclosed. The push rods are of the inverted mushroom type and provided with an adjusting screw and lock nut. The valves have 3½ per cent. nickel steel heads welded to carbon steel stems. The valve timing gears are helical with intermediate or idle gear adjustable for wear. The valve stem guides are unusually long and removable. The crankshaft is drop forged from special alloy steel. The crankshaft bearings, of which there are three, are located in the lower half of the base. They are made of die cast babbitt. The forward bearing is 3 11-16 in. long, the centre bearing 3⅝ in., and the rear bearing 5¼ in. All are 2⅛ in. in diameter. The connecting-rods are of drop forged steel with die cast removable bearings on the lower crank pin and are equipped with four bolts. The upper

Make your product pay—advertise in the CCJ

end is clamped to the piston pin, which oscillates in bronze bushings held in the piston.

The Two-Cylinder Engine

The two-cylinder Buffalo engine used by manufacturers of light tractors has 5½-in. bore and 7-in. stroke. Its weight without



The Two-Cylinder Model

This model, like the four-cylinder, has L-head cylinders. It develops 20 h.p. at 600 r.p.m.

the flywheel is 700 lb. It develops 20 hp. at 600 r.p.m. and 15 hp. at 400 r.p.m. The length between the outer ends of the crankshaft bearings is 30 in., the width of base overall 20 in., width between foundation blocks 14 in. The cylinders are of the "L" type, cast in block, all valves and valve springs being enclosed.

The push rods are of the mushroom type. The connecting-rods are drop forged with bronze back, the crankpin bearings are babbitt. The crankshaft is 2½ in. in diameter. The camshaft is one piece, hardened and ground steel. The crankcase and base are cast together and there are large panels on the crankcase to make it accessible. The valves are also accessible by means of inspection plugs at the top of the cylinder. There is a constant level splash system of lubrication. The connecting-rods dip in pits, a constant level of oil being maintained by an oil pump drawing oil from a reservoir cast in the base. An enclosed horizontal governor can be supplied. Ignition is high tension.

UNITED MOTORS CORP., New York City, announces that the greatest sales of its constituent companies for the nine months ending March 31st, amounted to $23,500,000, as compared with $17,200,000 for the corresponding months last year.

FULLER & SMITH, advertising agency, Cleveland, O., has been changed from a co-partnership to an incorporated company. There will be no change in the name. The incorporators are: Harry Dwight, president; Fred R. Fuller, vice-president and treasurer; Norman Craig, vice-president; A. Judson, secretary; P. W. Murphy, secretary to the president; C. L. Madden and C. E. Horton.

THE AUTO-PULL TRACTOR ATTACHMENT

A new device to convert automobiles into tractors suitable for farm work is offered by the Auto Pull Co., Inc., of Glencoe, Minn. It is known as the Auto Pull Tractor attachment. It can be used profitably for a wide range of work now being done by horses, such as plowing, discing, seeding, pulling binders, road drags, graders, hauling grain and many other uses.

The Auto Pull Tractor is a simple device to attach to a Ford car which converts it into a tractor by simply decreasing the speed and increasing the pulling power. It is easily attached and as easily detached. It ordinarily requires about 10 min. to attach, and about one-half that time to detach it.

It does not injure or disfigure the car to which it is attached, nor does the continuous working of the car in any way injure the engine or working parts of the car, as the car does not do the pulling, simply furnishes the motive power. The attachment, in fact, pushes the car along, the pulling power being created by gear reduction after leaving the car, all work being done in high gear.

This device attached to a Ford car will do the work of from four to five good horses.

The construction and method of attaching this tractor attachment is that it can in no way rack the frame of the car, the three-point suspension feature being used.

The power of the engine is applied to both rear wheels of the car, and the driving strain is the same as it would be in road use.

The regular farming speed is from 2 to 2½ m.p.h., but extra sets of gears can be furnished to give different speeds as may be desired. This machine is constructed along the latest improved mechanical lines. Frame parts made of angle steel. Wheels built up with steel spokes and a rolled steel rim with cleats riveted on the rim, right and left hand, and with a sufficient number of cleats so that the ends overlap. This prevents a lot of vibration when being used on a pavement or hard road. The main tractor wheels are carried on a large set of roller bearings.

All parts are made in duplicate and are interchangeable and made so that they can be changed in a field without any special tools.

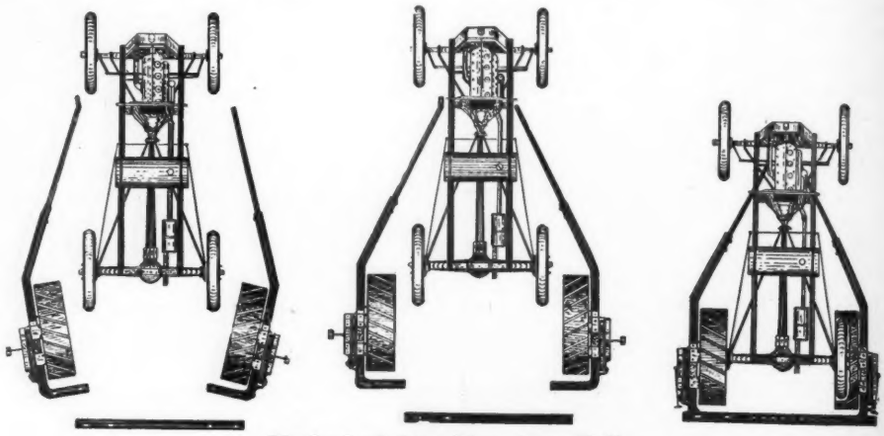
Each machine is shipped with a water tank attachment holding 10 gal. of water. This is to be attached to the radiator, which increases the volume of water that circulates through the radiator.

All parts that are subject to wear are bushed and made so as to be replaced at the smallest possible cost.

In the accompanying illustration Fig. 1 shows the device in position to back the car in between the two side sections. Fig. 2 shows the forward members of the frame pushed under the car. Fig. 3 shows Auto Pull attachment on car ready for work. The hub of the auto wheel enters the recess made for it in the hub of the attachment.

After both side sections are in place the draw bar is put in place, one bolt at each end is put in after the side sections have been drawn together. The two front ends are joined with bolts, and then fastened to the "U" bolt on the front axle. The U bolt will not always work in the center of the front axle, as sometimes the torsion rods on the car are not adjusted to equal lengths.

The price of the outfit is $200, with belt attachment, $225 f.o.b. Glencoe, Minn.



Method of Attaching Auto Pull

The car is backed into position, the forward members of the device are pushed under the frame, and then edged up to the wheels and fastened. The forward ends of the device are attached to the center of the front axle.

THE WAR DEPARTMENT will on June 1st ask for bids on trucks for the new fiscal year in the usual way despite the war with Germany. It is assumed that should an emergency arise, the Government can buy trucks in the open market, but no such condition is expected.

GRAMM-BERNSTEIN SALES CORP., 614-20 W. 57th Street, New York City, has superseded the R. E. Taylor Corp., now out of existence, and will be practically a factory branch of the Gramm-Bernstein Co., Lima, O. A full supply of all parts will be carried on hand at all times.

For its readers—information; for its advertisers—results. That's the purpose of the CCJ

OUR FARM TRACTOR RESOURCES IN THE EVENT OF WAR

Farm tractors, both gasoline and kerosene, can be relied upon to aid the United States in preparedness measures made necessary by any possible international complications, and just as effectively as tractors that may be used in actual army service, according to the Department of Agriculture, which has just completed a most extensive inquiry into the number of farm tractors, already owned by farmers, that will be used this year in cultivating the soil.

Among the first requisites of men in the army or navy, as well as those not engaged in warfare, is food. Therefore, to the farmers of the country, especially those who are using modern methods of farming, will the country look for support in a national crisis. According to the investigation made by the Department of Agriculture, there will be in actual use this year on farms of this country, 34,371 tractors. How many more will be purchased in time for use this year is, of course, a matter of speculation.

Divided as to States, the number of tractors now owned by farmers is as follows:

Alabama 313, Arizona 23, Arkansas 336, California 1358, Colorado 525, Connecticut 47, Delaware 34, Florida 71, Georgia 543, Idaho 262, Illinois 3202, Indiana 1852, Iowa 2223, Kansas 2287, Kentucky 348, Louisiana 343, Maine 53, Maryland 190, Massachusetts 91, Michigan 945, Minnesota 1575, Mississippi 377, Missouri 1141, Montana 808, Nebraska 1773, Nevada 19, New Hampshire 23, New Jersey 107, New Mexico 83, New York 1210, North Carolina 452, North Dakota 2137, Ohio 1305, Oklahoma 795, Oregon 318, Pennsylvania 595, Rhode Island 30, South Carolina 387, South Dakota 1527, Tennessee 442, Texas 2235, Utah 88, Vermont 75, Virginia 434, Washington 209, West Virginia 90, Wisconsin 904, Wyoming 186.

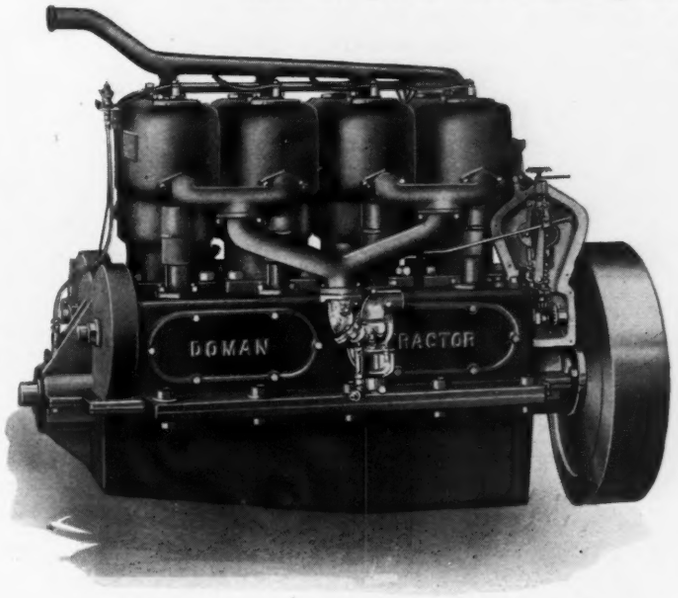
THE RUSSIAN REVOLUTION will make its effect felt on the automobile industry in that it will settle the unrest that has been felt for some time. While exports of automobiles have been going to Russia for war purposes in satisfactory quantities, matters dealing with credit have been in an unsatisfactory state and bankers in this country have for some time been very cautious in matters pertaining to commercial sales. Through the revolution this uncertainty is being removed, and manufacturers and their agents are feeling more enthusiastic over Russian opportunities than they did previously.

DOMAN LOW-SPEED TRACTOR ENGINE

The H. C. Doman Co., of Oshkosh, Wis., is offering in two sizes the Doman Slow-Speed Tractor Engine. These models are 5 x 6 in. and 6 x 7 in. Features of these are the three-piece semi-steel crankcase and the singly cast cylinders. The top section of the crankcase carries the crankshaft, the middle section provides the four compartments into which the rods dip, and the base acts as the oil reservoir, the pump being located in it.

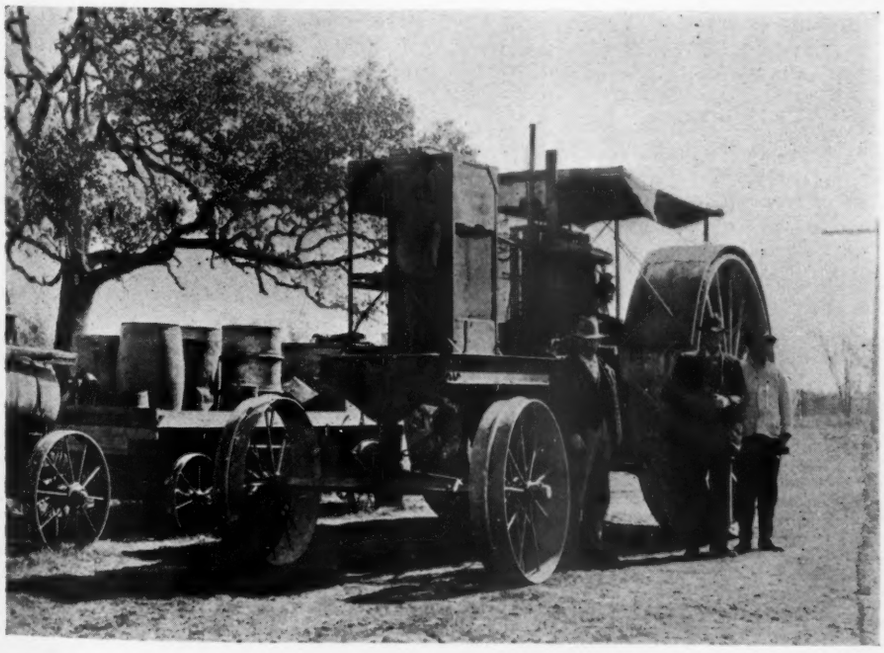
Cylinders are of semi-steel, "T" head type. They are accurately ground to size and tested. Pistons are also of semi-steel. The piston pin is of carbon steel, case hardened and ground. The connecting-rods are cast of a special alloy steel, and heat and oil treated. This is claimed to provide a stronger and more elastic construction than the drop-forged rod, and is also stated to eliminate crystallization. Rod bearings are die cast babbitt. The crankshaft has five bearings of special babbitt. It is of 35-45 heat treated annealed carbon hammered steel, machined and ground. The camshaft is of 35-45 carbon steel, supported on three bearings. Cams are keyed and pinned to the shaft. Valve diameter is large, allowing of a short lift anad reducing the noise. The valves have electrically welded nickel steel heads. The valve mechanisms are enclosed in aluminum dust-proof cases.

All gears are of 40-50 carbon steel, hammered and machined. All are case hardened and bushed. The water circulating pump is gear-driven and of ample capacity. The splash system in the base takes care of all the internal mechanism. Oil is pumped from a 5 gal. sub-base to the main compartment, and flows back to the sub-base when the proper level is reached. The magneto used is a type designed for tractors, and is high tension type. It is equipped with a starting mechanism, making a battery unnecessary. The carburetor is designed to burn either gasoline, kerosene, motor spirits or distillate.



Intake Side of Doman Engine

Cover of the governor removed, disclosing mechanism of same. This model is of the slow speed tractor type.



Four Years Without Overhauling

This Kinnard Haines nine-ton tractor has been in continuous service on the roads of Bexar County, Texas, for over four years, hauling scarifiers, graders, oilers and other road-making machines. During this period, according to its operator, J. J. Troxell, it has never been overhauled with the exception of replacing the piston rings. The king pinions were also renewed, owing to so much work on sandy roads. The tractor at present is being operated on gasoline, although it is arranged for kerosene burning and has been operated successfully on the latter fuel.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

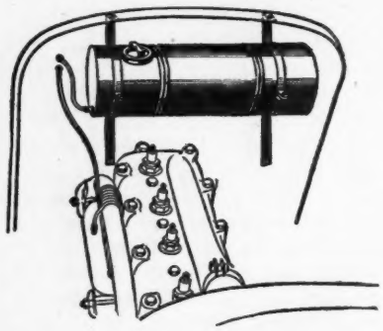
THE WATER GAS CARBURETOR

The Water Gas Carburetor offered by the Water Gas Carburetor Co., of Kansas City, Mo., is an outfit designed to supply super-heated steam to the mixture in the intake manifold, thereby preventing carbon accumulation in the engine. Briefly the outfit consists of the water gas carburetor, the copper water tank, brackets for the same, 10 ft. of copper tubing, and the special fittings necessary. The outfit sells at $18.

The tank is mounted on the dash under the hood or above the engine or supported upon the brace rod connecting the dash and radiator. The carburetor or sight feed must be placed slightly higher than the water tank and on the dash within sight of the operator, these two devices being connected by a section of copper tubing.

The water gas carburetor is a very highly finished and beautifully designed sight feed double jet instrument. The maker claims it is trouble proof, providing clean filtered water is always used. It is controlled by an air balanced governor to prevent overfeeding or underfeeding at varying throttle speeds. The water is drawn through the instrument by the suction from the intake manifold of engine while the adjustment for feeding water at the rate of 60 to 120 drops per minute (according to engine size) is controlled by the left hand needle valve. The other operates the short nozzle and is kept closed except for flushing the glass on inside.

Any motorist who will just consider his engine operation a moment must readily



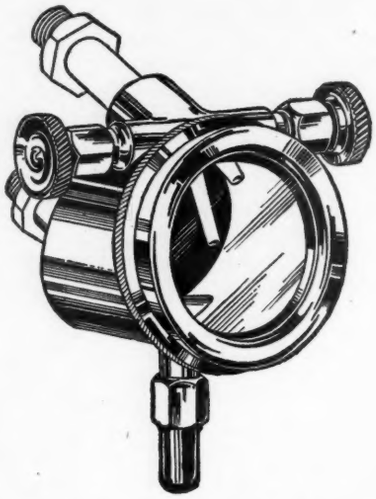
The Outfit Installed

Showing the tank, tubing, coil, etc. The carburetor device is located on the dash of the car

realize that the vacuum in his engine manifold is constantly varying according to the operation of the gas throttle and in fact the vacuum is greatest when the accelerator or throttle is closed for idling. This is directly opposed to an ideal condition for feeding water in the proper proportion to the combustion needs. It is, therefore, necessary to have a device which corrects this error.

The automatic air balanced governor is one of the important features of this instrument. This valve is made with a carefully weighted plunger which telescopes inside a tubular cup. There are no springs to catch or wear out, but gravity assures a permanent adjustment for all time.

The operation of this valve is dependent on the small air inlet at bottom of cup so that the weight literally floats in a stream of air and as the vacuum in the carburetor relaxes the weight proportionately seats itself until it automatically closes off the air flow and thereby assures a continued steady dripping of the water even though suction



The Water Gas Carburetor

This device regulates the drops of water drawn from the tank by engine suction. It also admits air through the automatic valve at the bottom.

has been greatly reduced by throttling of engine.

From the carburetor base another tube leads to the tubing coiled about the exhaust manifold, the tubing finally leading to the intake manifold.

The instant a drop of water is released from the end of nozzle the flow of air also serves the double purpose of rushing the water, one drop at a time, through the heating coil where (it is stated) the water is flashed into steam then into 1000 degrees superheated steam in which form it combines with the gas vapors in the manifold and thereby greatly enriches the charge for the combustion flash, the hydrogen gas burning with explosion while the pure oxygen supports a more complete combustion to consume the excess carbon and thereby increases power.

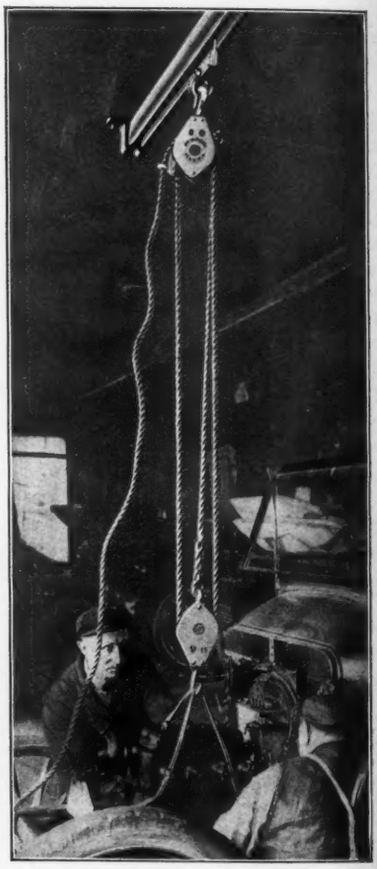
The tanks are made of solid copper, double-seamed and pressure tested to assure permanency. A highly efficient filter is fitted inside so that all water is thoroughly filtered before entering the carburetor. A set of Universal band brackets is also supplied, as well as installation instructions with every outfit.

THE PROVISIONAL GOVERNMENT OF ONTARIO contemplates placing tractors at the disposal of farmers as a means of greater production at a nominal charge per day or per acre. It has about 35 district representatives in the more important agricultural counties of the Province, and apparently intends to place a tractor at the disposal of each of these representatives, to be used in assisting the farmer to plow and prepare his land for the planting of crops. The tractors will be kept going day and night.

OVERHEAD TROLLEY CARRIERS

Some form of lifting and transporting mechanism is most desirable in an automobile assembly room or repair shop. In the Lane automatic blocks is a combination of an ordinary tackle and a positive self-sustaining feature. If the hoisting rope be held back at somewhat of an angle from the rest of the fall, the automatic lock grips the rope when the strain on it is released and thus holds the load without any tying or other fastening. If the hoisting rope is held near the fall the lock is fastened when the load is again taken upon it. Thus in the nearly vertical position the blocks operate freely, either up or down, as any ordinary rope tackle.

In combination with the hoist it is most convenient to have an overhead trolley carrier by which the load may be moved laterally and lowered outside the car. The ball bearing construction of the carrier gives



Lane's Overhead Trolley Carrier

Being used to lift out an engine. This is a very handy form of lifting and transporting device, and is found useful in the garage, assembly room, or repair shop. It locks in any position.

freedom and steadiness in motion. The track carrier and block are well made of high-grade materials and are guaranteed. This outfit is being produced by the Lane Bros. Co., Poughkeepsie, N. Y.

O'KELLY & WALKER, Atlanta, Ga., have been appointed as service station for the Philadelphia Diamond Grid battery, manufactured by the Philadelphia Storage Battery Co.

Advertising appropriations bring greatest returns when expended in the CCJ

Firestone

Truck Tires

When you equip your trucks with Firestone Truck Tires you do so with the assurance that you have obtained the most recent, proved design. For example, Firestone Giant Tires, here illustrated, were the first of their type. Three years ahead of other truck tires. They dominate the heavy truck field today. They respond to the formidable demands of heavy duty service with resilience, traction and Most Miles per Dollar.

There's a Firestone Tire built especially for your truck and your service. Call in the Firestone man.

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

The Three and a Half Ton, Four-Wheel Drive Duplex Truck

THE new company which recently took over the Duplex Power Car Co., of Charlotte, Mich., has tripled the production of the Duplex 4-wheel drive trucks and added a 15-acre plot in Lansing. Upon this new tract will be built a new plant and production will be doubled upon completion. The new company is known as the Duplex Truck Co., of Lansing, Mich.

The features of this truck are its pulling power, the Duplex Adler self-locking differentials; the oversize "dead" axles, general simplicity, and economy of operation. In the Duplex 4-wheel drive both front wheels exert a constant, smooth continuous pull, while both back wheels at the same time exert a like push.

The Duplex method of distributing the power application directly to each of the four wheels makes possible a simple construction throughout the chassis. The benefits of this simplified chassis construction are twofold: First, the elimination of excessive weight, which brings lower cost for operation and upkeep; and, second, the reduction of the number of parts necessary, a like reduction is made in the care required to keep the truck in efficient operation.

Another direct result of the more efficient application of power and elimination of excessive weight is a decrease in gasoline consumption and an increase in tire mileage, frequently reaching 30 per cent.

The four-wheel drive is made practical by the Duplex internal gear drive on each wheel. This internal gear drive combines the advantages of both the shaft and chain drives. The 16-tooth spur gear at the end of each live axle meshes with the 64-tooth internal ring gear attached, in a housing, to each of the four wheels giving a 4 to 1 speed reduction. This simple construction relieves the differentials and propellers of most of the strain that they are usually forced to undergo.

One of the fundamentals and vital points that should be noticed in the Duplex internal gear drive is the fact that the power is applied not at the hub, or center, of the wheel, but at a point further out toward the rim. The efficiency of the power used is increased in direct ratio to the distance that the point of application is removed from the hub and brought nearer to the rim—in other words, as the leverage is increased.

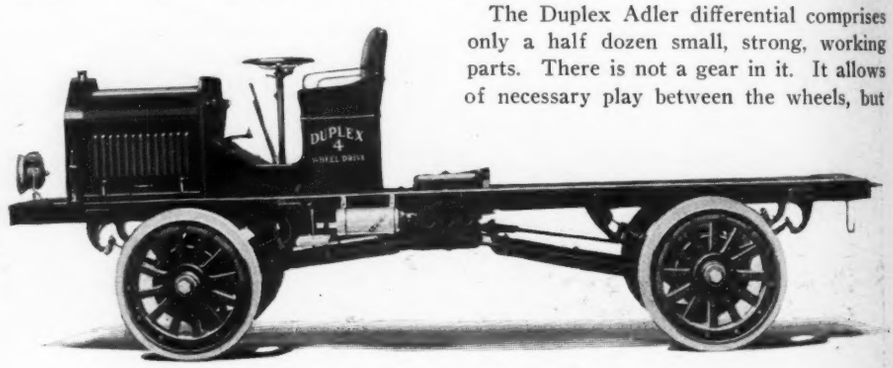
In the Duplex the dead load of the truck itself, plus cargo, is carried on solid, one-piece axles. These axles are of drop forged steel, I-beam in shape. By this construction the live axles are relieved of all duty save that of transmitting power to the wheels.

Another noticeable feature is the increased road clearance. The Duplex internal gear drive allows 16 in. of road clearance, front and rear—sufficient to allow the Duplex to pull through a plowed field, pick its way over a rock cluttered path or negotiate deep ruts.

The Duplex Adler differential comprises only a half dozen small, strong, working parts. There is not a gear in it. It allows of necessary play between the wheels, but when one wheel slips the differential automatically and positively throws the entire power over to the wheel on the opposite side, which still has road traction.

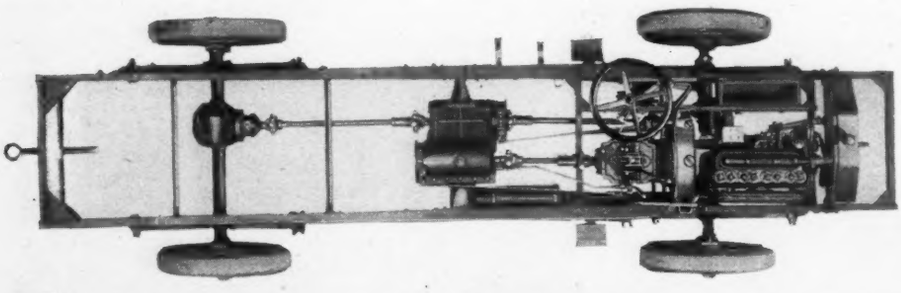
So long as one of the four drive wheels of the Duplex can find traction, the Duplex cannot be stalled. With self-locking differentials on both front and rear axles, the Duplex driver is able to extricate his truck, with a full load, from a situation in which three of his wheels are helpless through lack of traction.

The chain case, by means of a silent chain belt, transmits the power from the main propeller shaft to the shafts actuating front and rear axles. This chain case serves a purpose more important than the mere transmission of power from the main shaft to the front and rear propellers. By means of a second or reserve chain with sprockets, this chain case provides the driver an extra 2:1 gear reduction whenever he needs it. The use of this chain case reduction by



Duplex Four-Wheel Drive Three and a Half Ton Chassis

This model has a Buda engine, 4¼x5½ in.; 130in. wheelbase; Eisemann magneto; and Schebler carburetor. A three-speed transmission is used, and the chain case provides in addition a 1–1 or 2–1 ratio



Plan View of the Duplex Truck Chassis

Herewith is illustrated the clean-cut simplicity of this four-wheel drive chassis. Power is carried on the main shaft from the engine through the disc clutch and three-speed transmission to the chain case. Here it is transferred by a silent chain belt to the propellers, which turn the front and rear live axles.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

On the Job—Always

The reason Signal Motor Trucks are "on the job"—always, is that they are designed and built for that purpose by men who know how to design and build for that purpose.

It is one thing to **say** you build your trucks that way; another thing to **build** them that way.

It is because we build Signal Trucks to "stay on the job" that we use such high quality constructional units as Continental Motors, Timken-David Brown Worm Drive Rear Axles, Brown-Lipe Transmissions, Ross Steering Gears, Eisemann Magnetos, etc.

It is because we use such positively high grade construction that we are not afraid to say exactly what we mean.

It is possible to build cheaper trucks, but it isn't possible to build any better trucks.

Moreover, what we say applies with equal force to our one-ton jobs and our five-ton jobs—and all the sizes in between.

Signal sales are growing. Signal reputation is spreading. Everybody says the Signal has the cleanest mechanism of any truck made. That fact helps the sales as much as it helps the service.

Dealers who are interested in both Sales and Service—and owners who are interested in Service more than Sales, find the clean-cut Signal Chassis equally attractive.

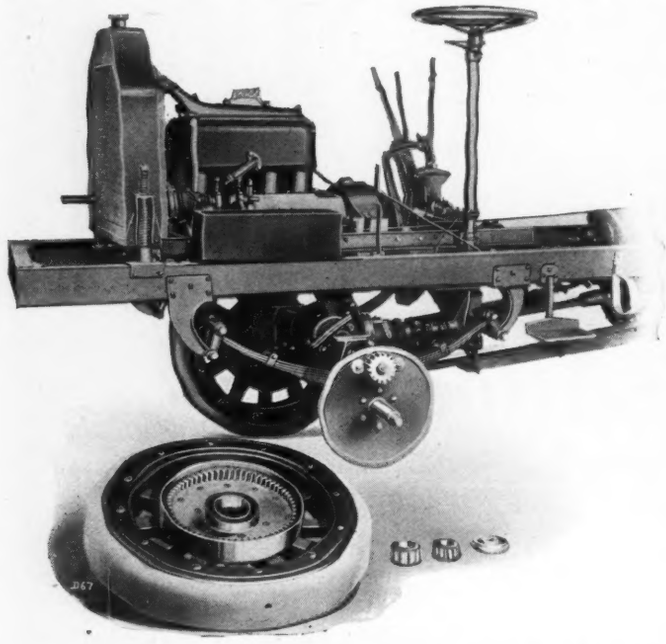
Write for Literature

Signal Motor Truck Company
Detroit, Michigan

SIGNAL
1-1½-2-3½-5 TON

the Duplex driver practically doubles the power applied to his wheels. With one motion of his hand he obtains the tremendous leverage of 64 crankshaft turns to every revolution of each of the four wheels. This amounts to a full power stroke of the engine for every 2 in. of truck travel.

The Duplex application of power to all four wheels also permits a positive brake action working simultaneously on all four wheels. The service, or foot brake, contracts on the main propeller shaft evenly and smoothly at the rear end of the chain case. It slows the whole driving mechanism surely, but without the semblance of a jerk. The emergency, or hand brake, grips the front and rear propeller shafts in a positive, but equally smooth action. It will be noted that brake adjustments can be made quickly by the simple turning of a screw on the brake band. Either of these two powerful brakes will hold the Duplex fully loaded on the slope of the steepest hill.



Chassis, Front End

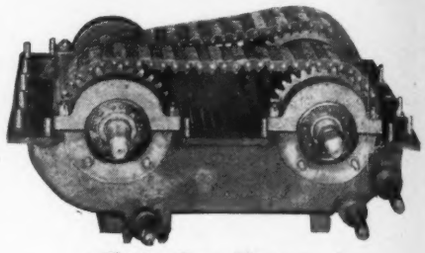
The simplicity of the means by which power is applied to the driving wheels is made clear in this photograph of the front end chassis assembly. The spur gear meshes with the ring gear attached to the drive wheel, applying the driving leverage near the rim of the wheel, where it reaches the greatest efficiency. This also relieves the axle of much of the driving strain borne by it in other drive methods of power application.

The Duplex spring suspension, with shackles at each end, is an important contributing factor to Duplex long life, ease of control and strength without excessive weight. No matter how the Duplex is loaded the wheelbase is always the same. Grease cups provide the lubrication for the spring shackle bolts, carried in bronzed bushings. Both front and rear springs are 43 in. long, semi-elliptic in type and hung at both ends by shackles to the frame. The Duplex frame is of pressed steel, channel shape, firmly held at the corners by gussets of boiler steel. It is 18½ ft. long, perfectly balanced and reinforced by four strong cross members. Special provision is made in the rear end construction of the frame to withstand the abnormal wrenching strains on the draw bar from a string of trailers in tow. The draw bar coupling is cushioned in the strong spring which partially absorbs the shock from quick twisting trailer jerking. The balance of these shocks passes on to the double reinforcement of pressed steel and frame corner bindings of boiler steel gussets.

Duplex wheels are of the artillery type, of second growth hickory and interchangeable. Each weighs 375 lb. and has twelve spokes. Hubs are of malleable iron and interchangeable. The wheels turn on Bower roller bearings. The steering gear is the Lavine irreversible worm type. The steering wheel, through the post, actuates a splined and tapered arm, which moves the drag link to connecting with the tie-rod tube. The splined and tapered arm absolutely prevents loosening with wear at this point, and a corresponding backlash. Any lost motion or slack in the steering wheel can be taken up quickly and requires the use of no other tool than a common wrench.

Engine clutch and transmission are built as a unit. The engine is a four-cylinder Buda developing 40 h.p. The power plant fulfills every demand of rigorous heavy hauling conditions. It is hung by a three point suspension to avoid twisting stresses and strains.

Cylinders are cast in block with a 4¼-in. bore and a 5½-in. stroke. Lubrication is force feed and splash, a plunger carrying the oil to the main bearings and timing gears, and the constant level splash system throwing oil to the cylinder walls. Capacity is provided for six quarts of oil. Valves



Chain Case Uncovered

The chain is shown with the cover removed, disclosing the gears and chains. This unit provides double reduction in emergency cases of hard pulling.

are 1⅞ in. in diameter and are made of tungsten steel. They are unusually accessible for grinding or cleaning out carbon.

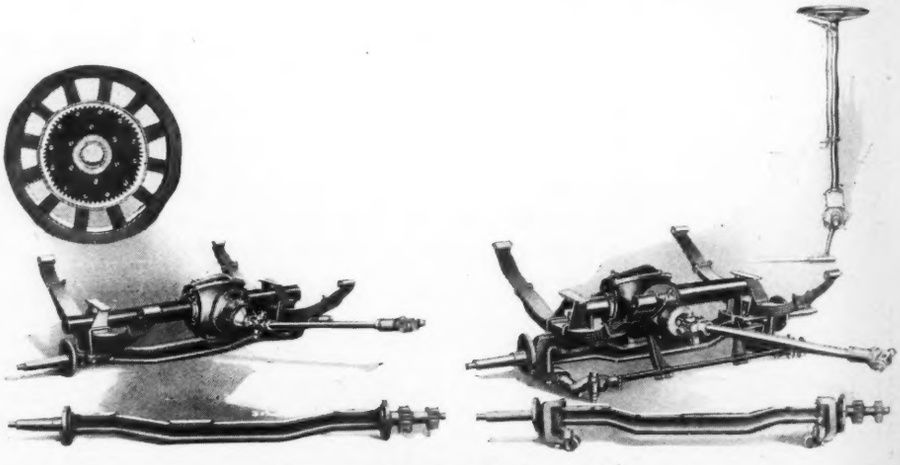
After a thorough and exacting test of carburetors, the Duplex engineers chose the Schebler as best meeting the Duplex requirements. A dash air control is provided for the driver's convenience. A muffler cut-out is also standard on Duplex trucks.

The Duplex transmission is the positive clutch type, three speeds forward and reverse. Gear reductions are 1:1 in third speed, 2:1 in second speed, 4:1 in first speed, and 4.125:1 reverse. At the driver's instant command are the following wide range of speed reductions:

With 1 to 1 chain case reduction the ratio is approximately 8:1 on high, 16:1 on intermediate, 32:1 on low, 33:1 reverse.

With 2:1 chain case reduction, approximately the ratio between engine and rear wheel is: 16:1 on high, 32:1 on intermediate, 64:1 on low, 66:1 reverse.

Of the several types of clutches the Duplex engineers selected the dry multiple disc, because of its smooth and positive action. The Stewart vacuum gasoline feed



Front and Rear Axle Assemblies

On the left is shown how the Duplex weight load is carried on the "dead" axle, relieving the "live" axle of all duty save transmission of power. Notice the distance of the internal ring gear from the hub of the wheel. The Duplex semi-irreversible steering gear, shown at the right, has all the strength of simplicity. All necessary adjustments are made by the simple turning of a thumbscrew. The front axle assembly shown below it illustrates how the Duplex engineers have been able to reduce the weight of the rear axles, and still retain an oversize "dead" axle to carry the full capacity load and meet all contingencies

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

PROOF

Fore and Aft Steering Gear

The Steering Gears that Predominate on Motor Trucks

ONE hundred and fifteen motor truck manufacturers—representing considerably over half the entire industry—demand the safety, reliability and easy operation in steering that are guaranteed by the enormous bearing surfaces of the design of

ROSS GEARS

The motor trucks represented by the seventy-five trade-marks shown in this advertisement—and forty more whose trade-marks are not shown—are equipped with Ross Steering Gears.

The use of Ross Gears by these one hundred and fifteen manufacturers is the best proof in the world of the quality of our product, and those who know Ross Gears know that they can expect the same high quality all the way through in the truck that is equipped with them.

Write for catalog and any special information desired

Ross Gear & Tool Company
760 Heath Street Lafayette, Indiana

system is used on the Duplex. Gasoline tank capacity is 25 gal.

The Duplex cooling system prevents overheating, even when the truck is working for long intervals on low gear pulls. The round, vertical tube radiator affords a great cooling surface. After passing through the radiator the seven gallons of water used in the cooling system are picked up by a gear-driven centrifugal pump and forced through water jackets to every part of the engine, and thus back to the radiator. The fan has four high pitch blades. Standard Duplex equipment includes horn, Prest-O-Lite tank, lamps and a complete set of tools.

Specifications of the Duplex

Capacity—Normal capacity, 7000 lb.

Wheelbase—130 in.

Tread—Front and rear, 60 in.

Tires—Front and rear, 36 x 6 in. single solid.

Chassis—Length over all, 223½ in. Width over all, 70 in. Rear of seat to rear of frame, 128 in.

Engine—Buda. Horsepower, 40. Four cylinders, 4¼-in. bore x 5½-in. stroke.

Ignition—Eisemann high tension magneto.

Carburetor—Schebler float feed type, 1¼ in.

Cooling System—Positive water circulation by gear driven centrifugal pump. Round vertical tube radiator.

Clutch—Enclosed dry multiple disc.

Transmission—Positive clutch type, three speeds forward and one reverse.

Drive—Shaft drive with two universal joints from engine to chain case. Shaft drive with two universal joints each from chain case to front and rear axle. Reduction from axle driver to wheels, 8 to 1.

Springs—Semi-elliptic, each 3 x 41⅜ in.; 6 leaves in front springs and 8 leaves in the rear.

Brakes—One service brake located on lower chain case shaft operated by foot pedal. Emergency brake on upper chain case shaft operated by hand lever. Brake bands lined with Raybestos.

Front and Rear Axle—Steel forging, 3-in. "I"-beam section. Bower roller bearings.

Steering Gear—Left side irreversible worm gear type.

Turning Radius—30 ft.

Tank Capacity—Gasoline, 25 gallons; lubricating oil, 6 qts.; water, 7 gallons.

Price—$3600, f.o.b. factory.

The Seven-Ton Worm-Drive Stegeman

SEVEN TONS in capacity with strength and sturdiness predominating features gives one a brief idea of the latest offering of the Stegeman Motor Car Co., of Milwaukee, Wis. This model follows the general lines of construction of its predecessors. The engine used in this model is the same as that of the five-ton, namely, a Spillman six-cylinder, with a bore of 4 in. and a stroke of 5½ in. The wheelbase is 168 in., tread 69 in., chassis weight 11,000 lb. The equipment is complete, comprising, in addition to the electric side lamps and tail lamp, tools, hub odometer, electric horn, jack, seat, etc., an electric starter and generator. The price is $4600 f.o.b. Milwaukee, with the above mentioned equipment.

Unit Power Plant

The engine is equipped with a sealed governor, which limits the engine speed to 1100 r.p.m. This allows a maximum car speed of 10 m.p.h. Lubrication of the engine is by splash, in addition to the force feed system. A double plunger pump forces oil under pressure to each bearing, thus assuring correct lubrication of vital parts.

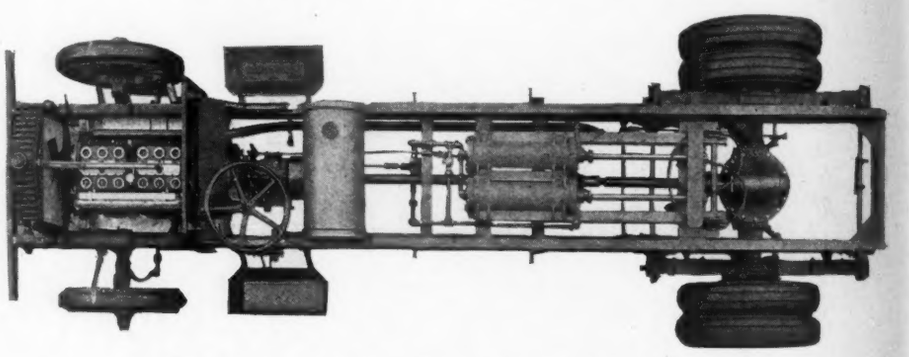
The engine, transmission and clutch are mounted in unit in the chassis, and have three-point suspension. The transmission is selective type, with three speeds forward and one reverse, and the clutch is of the multiple disc dry plate type.

The latest type of Rayfield carburetor is used and ignition current is furnished by a Bosch high tension magneto. The starting motor and the generator units are Westinghouse make. When these are not furnished an allowance of $100 is made. The water of the cooling system is circulated by a gear-driven centrifugal pump.

A channel section frame of steel is used of ⅜-in. stock, 9 x 2¼-in. channel. The service brake is internal expanding on the propeller shaft and the emergency is of the same type, operating, however, on the rear wheel drums.

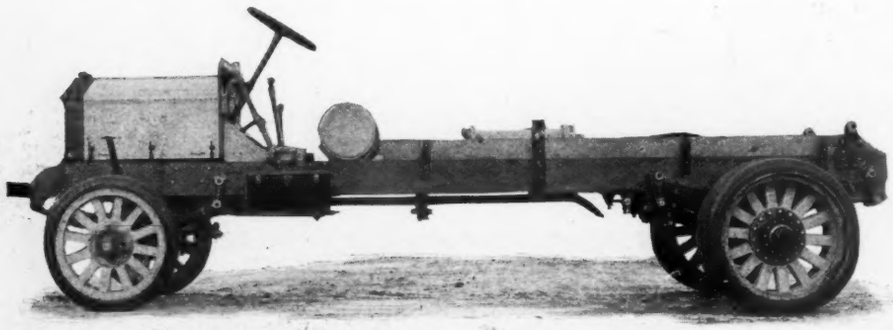
The front axle is a Timken 3 x 4¼-in. section. The rear axle is full floating of worm drive type with David-Brown worm gears. The reduction is 15:1.

The springs are semi-elliptic front and rear, of mangano-silicon steel. The front are 52 x 3½ in. and the rear 60 x 40 in. The front tires are 36 x 6 in. and the rear 40 x 7-in. duals. The steering gear is of the irreversible worm and gear type. The driver's seat is on the left with center control. The throttle is operated by the foot, thus doing away with steering column levers.



Plan View of the New Seven-Ton Stegeman Chassis

Showing the chassis as equipped with Young hoist mechanism. Notice is called to the exceptionally sturdy appearance of the chassis in general



Side View of the New Stegeman Seven-Ton Chassis

This model has the same engine as the five-ton model. It is a six-cylinder Spillman; bore, 4 in.; stroke, 5½ in. The chassis weight is 11,000 lbs.; wheelbase, 168 in.; and tread, 69 in.

THE WAUKESHA MOTOR CO., of Waukesha, Wis., has recently issued a splendidly written booklet on the "Care and Operation of Waukesha Engines." This booklet is profusely illustrated and imparts a fund of engine knowledge that should prove of great interest to both the experienced repairman as well as the novice. More than a dozen pages are devoted to questions and answers on the most common engine troubles.

United States Tires 'Solid Truck'

More Mileage at Less Cost

is the verdict of thousands of enthusiastic users of the new United States 'Solid Truck' Tire.

Neither expense nor trouble has been spared to produce from our laboratories and factory a 'solid' truck tire that would better any truck tire in use.

The result is a veritable chorus of enthusiastic satisfaction from hosts of delighted truck owners who report that the new, compact, resilient and durable United States 'Solid Truck' Tire delivers more mileage than any other truck tire they have ever used before, and that it cuts down truck maintenance costs considerably.

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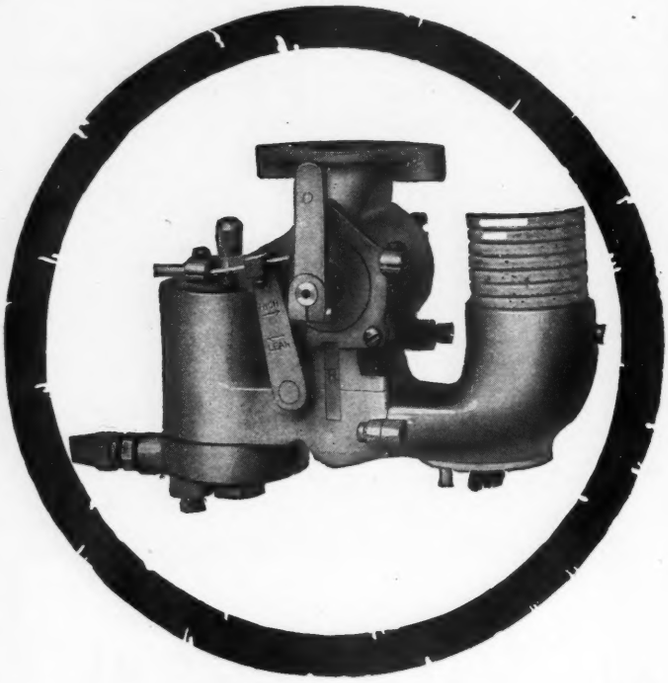

When?

The Master Carbureter is in the second year of its existence—yet it is more widely talked about than other carbureters that have been on the market for many years. Why? Because its sensational performances compel the attention of everyone interested in motor trucks—in increasing their efficiency—in cutting the cost of operation.

The Master Carbureter is the FINAL Carbureter. It means the elimination of the old "carbureter troubles," it means *Greater Economy* and *More Power*. The Master has already *proved* its superiority to 23 leading truck manufacturers and to thousands of truck owners, to Fire Departments in leading cities, including New York City, and to carriers of the U. S. Mail.

We are ready to *prove* the Master to you—entirely at our expense. We guarantee 25 to 40% More Mileage and 30% More Power on *your* trucks. Are you ready to be shown?

Just drop us a line—no obligations.

Why Not NOW?

The unique multiple fuel feed is the secret of the Master's wonderful *economy* and *power*. Each of the 14 tiny jets delivers a gaseous mist in the path of the inrushing air—the fuel is *thoroughly vaporized*—every particle attains the highest degree of combustibility. You get the last ounce of power from every bit of gas.

There are no "unexploded centers"—no unused gas shot through the exhaust—no waste. You get as much mileage from FOUR quarts of fuel with a Master Carbureter as you get from FIVE quarts with an ordinary carbureter. Our figures are not based on special tests—they are the result of every day operation, under all conditions.

MASTER CARBURETER

The Carbureter With *No Adjustments*

The Master Carbureter frees the driver from the greatest of all carbureter troubles—adjustments under the hood. There are NO Adjustments on the Master. All grades of fuel, all weathers, all altitudes and all climates are perfectly and instantly accommodated by the Master's wonderful Steering Post Control. From the driver's seat the mixture can be enriched or rarefied at will to meet any condition. For quick starting, for rapid acceleration, for range of power and flexibility the Master Carbureter has no equal.

Post yourself on this carbureter that is different—write for the facts today. No obligation.

Mail Coupon For FREE booklet, "Carbureters and Carburetion," and new Master Catalog

Whether you are a manufacturer, owner or driver of motor trucks, send your name at once for free copy of valuable new book. It explains the scientific principle of carburetion, the causes of carbureter troubles, and also shows why the Master Carbureter accomplishes such marvelous results. Send the coupon NOW—or a postal to

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MASTER CARBURETER CORPORATION

1205 W. FORT STREET, DETROIT, MICH.

Pacific Coast Branch, 922 S. Los Angeles St., Los Angeles, Cal.

New Garford Model 70B Has Two Tons Capacity

ONE of the notable features of the line of trucks manufactured by the Garford Motor Truck Co., of Lima, Ohio, is its new 2-ton model 70 B. This new product embodies all the latest ideas of Garford engineers in truck construction and equipment.

One of the Model 70 B's outstanding characteristics is the protective equipment it carries. Besides the heavy steel bars which guard the radiator against accidental jamming or puncture, a massive steel bumper is bolted to the front cross-member of the frame so as to sustain any shock which might result from bumping against the rear end of another truck, as in dense traffic or from collision with a loading platform.

The Garford type of engine has 4 vertical cylinders cast en bloc, "L" head type. Dimensions are 4¼ x 5½ in. The horsepower is 29, S. A. E. rating. A notable feature is the crankcase, the integral arms of which form a three-point support for the engine. It is made up of two castings, the upper half supporting the bearings, shafts and gears, the lower half forming the oil reservoir, and so constructed that it is easily removable without disturbing the bearings. The valve operating mechanism is of improved design with pushrods of the mushroom type carefully hardened and ground to a very close fit. Valves are fully enclosed on the right side of the engine. Garford ignition is accomplished by a high tension magneto driven from the engine. The wiring is extremely simple and is carried in an accessible position. One set of spark plugs is provided and the spark advance is controlled from the steering column.

Lubrication is accomplished by a circulating splash system, which is entirely self-contained. The oil is pumped through a sight gage on the dash to indicate the proper functioning of the system. The oil level in the reservoir is indicated by a suitable device designed for the purpose. The engine is cooled by water, which is circulated through liberal water jackets and a tubular radiator by a centrifugal pump. Cooling of the radiator is assisted by a large fan driven from the engine.

Power is transmitted through the Garford disc clutch. This is of the dry disc type enclosed in a housing attached to the crankcase, and requires no lubrication or attention. The gear box is located midway between the engine and rear axle and is notable for its sturdy construction. It has selective sliding gears and provides three speeds forward and one reverse. The gears, shafts and shifting members are of carefully selected material and run on bearings of high quality. Final drive to the rear axle is transmitted through a steel propeller shaft which is practically horizontal under load. The shaft has universal joints at the ends, and is of ample size for the requirements.

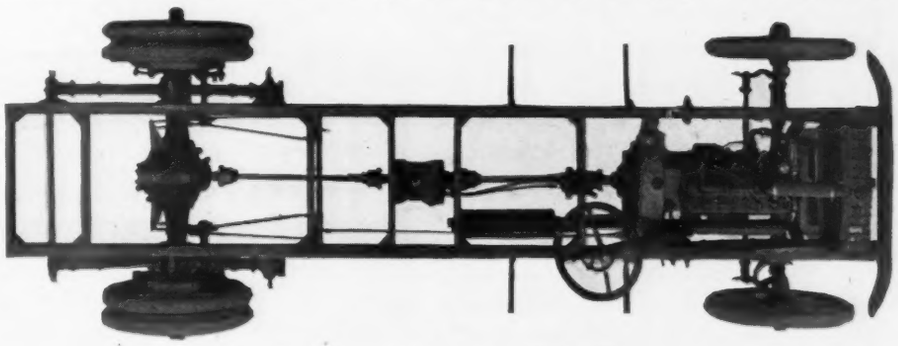
The rear end construction of this truck makes a noteworthy assembly. The rear springs are arranged with a three point forward shackle on each spring and this, with the Timken-David Brown worm drive axle, provides not only one of the latest designs of rear-end construction, but it does away entirely with the need for radius rods. For example, if the main leaf of a spring should be broken, in accident or collision, the next leaf of the spring immediately takes up the strain and load.

The rear axle incorporates the newest type of worm drive with a worm of hardened steel mating with a bronze gear. The differential is of the bevel type with the differential carrier supporting the bearings of the worm shaft, and makes a unit of the worm, worm gear and differential.

Model 70 B is made in three styles—the standard chassis, which provides for 9 ft. loading space back of the driver's seat; a special long chassis providing for 12 ft. loading space back of the driver's seat and a tractor type chassis. The gasoline tank is located under the driver's seat, and has a capacity of 25 gals.

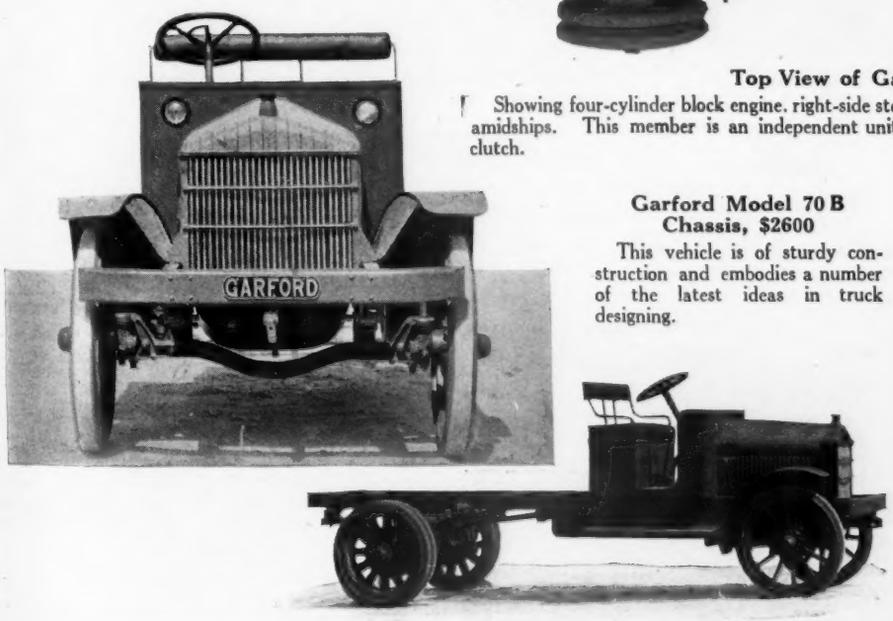
Tire equipment is conventional, being oversize single tires for the front wheels and oversize dual equipment on the rear wheels. General equipment includes: Odometer, curved steel dash, two oil lamps set flush in dash front, one oil lamp in rear; driver's seat with cushions, jack, tools, vibrator horn and oil can.

Price, chassis in lead, f.o.b. Lima, Ohio, $2600.



Top View of Garford Model 70 B

Showing four-cylinder block engine, right-side steering with center control, and the transmission located amidships. This member is an independent unit and may be easily removed without disturbing the clutch.



Garford Model 70 B Chassis, $2600

This vehicle is of sturdy construction and embodies a number of the latest ideas in truck designing.

"A POINTER TO PROFITS" is the title of the latest truck catalog issued by Cadillac Auto Truck Co., of Cadillac, Mich., builders of the Acme 1, 2 and 3½-ton trucks. Besides being a credit to the printers' art this catalog also describes the history of this company and its manufacturing facilities in a most interesting manner.

UNITED STATES TRUCK TIRE SALESMEN recently made a visit to Providence, R. I., to study the manufacturing process of the tires they sell. A thorough tour of inspection was carried out under the direction of Mr. Waite, and keen interest was displayed by the salesmen in the highly scientific steps taken by the company in the making of the U. S. truck tires.

Merit wins—that's why the CCJ is the leader

Gem Light Delivery First Product of New Concern

By C. W. SHAFER

ORGANIZED with a capital stock of $250,000, the Gem Motor Car Corp. will shortly begin active operations at Grand Rapids, Mich., manufacturing two models of light delivery trucks and a 5-passenger pleasure car. A factory building has been purchased in Grandville Avenue, S. W., at the Pere Marquette tracks. All chassis will be secured from the Detroit Chassis Co., an initial contract for 1000 pieces having been placed, and all bodies will be made in Grand Rapids. A. B. O'Neill is president of the company; Beverly Deuel, 405 Murray Bldg., secretary, and John Gray, a director of the Detroit Chassis Co., chief engineer.

The Gem Model A, light delivery, with an open express body, has a body built of oak and ash strongly braced and heavily ironed with malleable iron. The sides are 14 in. over all. Oak flareboards are used, and the floor is hardwood with steel strips. The length is from 66 to 150 in. and the width, 42 to 66 in.

Engine

A Golden, Belknap & Swartz engine, of the four-cylinder high speed "L"-head type, is specified. This engine has large adjustable mushroom valves 1¾ in. in diameter on the clear with stems completely enclosed. The lubrication is a combined system which feeds oil to all parts. Connecticut distributor and coil, mounted on the generator, furnish the ignition. Starting and lighting is two-unit 6-volt, with regular starting switch and cut-out.

The transmission is three speed integral with the engine forming a unit power plant. Shaft drive to the semi-floating rear axle is through a 4 to 1 adjustable bevel gear, with pinion type differential. Ball bearings are used on the pinion shaft and Hyatt high duty bearings on the axle shafts. The service brake is external contracting, and the emergency brake is internal expanding. Brake drums are 12 in. in diameter.

Other Details

The springs are 1¾ in. by 35 in. semi-elliptic in front and 1¾ in. by 48 in. three-quarter elliptic in the rear. These are fixed at front end to transmit the drive and are slung beneath the rear axle. The main leaf is of extra thickness and special quality, to complete a perfected Hotchkiss drive through two universal joints. All braking and power torques are taken through the rear springs, no torque rods being used. The frame is pressed steel channel type, 4 in. by 1½ in. by 5-32 in., narrowed at the front to 28 in. overall, to permit of short turning radius. Brackets are fitted in the rear for a 15 gal. gasoline tank. The wheelbase is 112 in.; tread, 56 in., and the road clearance 10½ in. The price of the Model A is $675 f.o.b. Grand Rapids. An all-purpose cab to fit is $25 extra. Two full-width upholstered seats, $25 extra. This model, with oiled duck top and side curtains, sells for $700.

Model B is constructed after the same general specifications as Model A. It has a full panel body, of oak and ash, heavily braced with steel. The panels are of steel. Side curtains enclose the driver. The width is from 42 to 72 in.; length, 54 to 132 in.; height, 57 to 66 in. The rear doors are double with oval glass set in mouldings. The price is $725, f.o.b. Grand Rapids.

Koehler Brings Out New Truck

Still specializing on one model only, but of greater carrying capacity, the H. J. Koehler Motors Corp., of Newark, N. J., is putting out the new model K-1¼ Koehler truck with strengthened chassis and refinements calculated to increase its efficiency.

The Koehler four-cylinder, 35 h.p. engine is of the overhead valve type and features increased compression and lighter pistons. Either Eisemann or Heinze magneto ignition is supplied as regular equipment.

The rear axle is internal gear drive and the rear springs have three unusually heavy main plates to thoroughly accommodate the Hotchkiss drive and 1¼-ton load capacity.

Large size rear tires and full 2 in. diameter front wheel spindles add to the wear resisting qualities and the increased spoke sizes care for end thrust and braking strains.

The open-express type of body with four post top or driver's cab front continues to be popular. This body has a 9 ft. loading space back of the driver's seat and provides the fullest width allowed with standard wheel tread. Equipment consists of front and rear lamps, mechanical horn, fenders, artillery seat with lazy back and complete set of tools.

New Koehler One and a Quarter Ton Truck

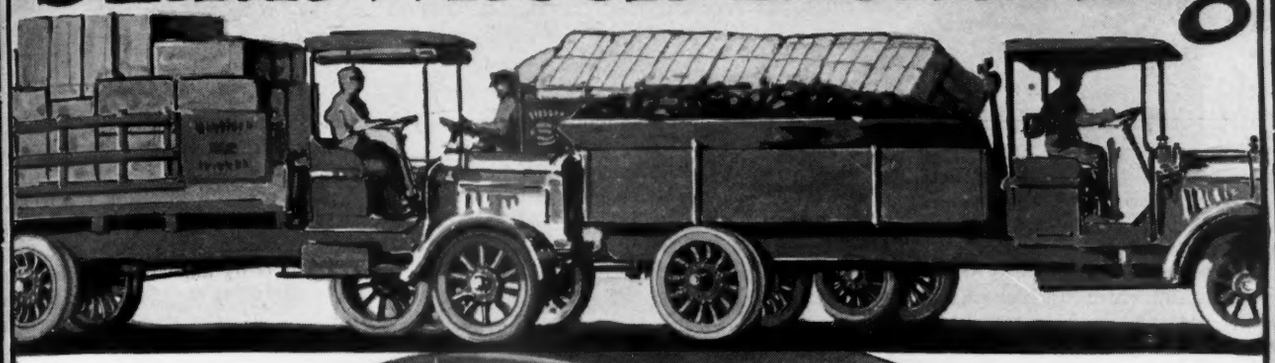
This job is known as the Model K-One and a Quarter, and supplants the former one-tonner built for the past year and a half

Gem Model "A" Light Delivery; Price, $675

Has 31.9 h.p engine, three-speed transmission and semi-floating rear axle. Production of these trucks is well advanced and deliveries will shortly be made to dealers.

FAMOUS TRUCK CO., INC., manufacturer of a light delivery car to sell at $650, will locate in St. Joseph, Mich., and work on the erection of a plant will be started at once.

Smith Wheels Everlasting



ONE Rear Smith Wheel will sustain **Ten Five-Ton Trucks loaded to capacity!**

Lighter Than Wood — Many Times Stronger

Smith Wheels Guaranteed DURING LIFE OF TRUCK on which originally placed.

Tire Mileage Increased — Gasoline Mileage Increased
Truck Life Increased

SMITH WHEEL INC.
SYRACUSE, N.Y., U.S.A.

TRAILER DEPARTMENT

MOTOR REPLACES STAGE COACH

The old stage coach, a more or less picturesque detail of the old days, is fast disappearing and being replaced by the modern motor driven vehicles.

Last year Barney Taylor, of Cape Cod, gave up his coach, which he had driven for thirty years, and which his father had driven before him, and took the one step that placed him among the up-to-date and enterprising citizens of the town by purchasing a motor car for transporting his passengers and a neat little trailer for baggage, mail, express, etc.

His stage trip is between Hawick Port and Hawick Station in Massachusetts and this trip he has to make four times a day. There are no long waits now, for the horses to feed and rest, a train can be met and the return trip undertaken at once, and the whole day's trip is made in half the time, leaving Barney with time on his hands. In the last nine months he has made 9000 miles with his little machine, always carrying a trailer piled high with express and baggage, and if he regrets the old coach he never mentions it.

THE ROGERS DECK TYPE SEMI-TRAILER

The Rogers Bros. Co., Albion, Pa., is introducing its deck type semi-trailer, built especially for heavy hauling. This form of trailer is built of seven lines of steel channels and the deck is covered with No. 10 gage steel plate which makes a very rigid construction. On ordinary roads the semi-trailer is claimed to increase the capacity of a truck three-fold, without putting any overload on the truck itself, other than a slight difference in traction. In unloading it can be backed to the curb and the truck can be left at right angles with the trailer, thereby taking up the least possible street space.

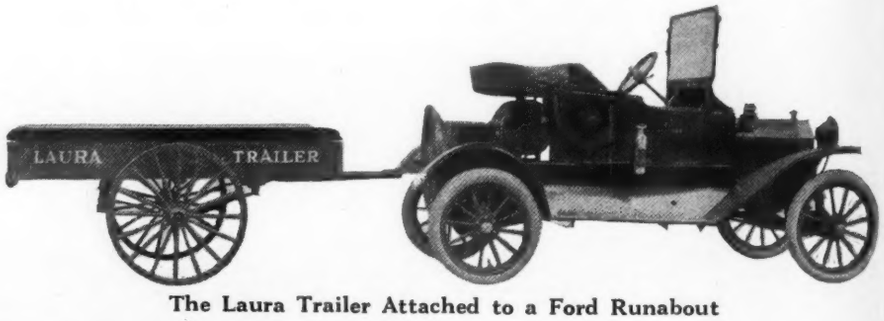
A Five-Ton Semi-Trailer Loaded With Logs

In using the trailer almost the entire load is placed upon the deck and incidentally the axle and wheels. When not in use it can be easily detached from the truck. The connection to the truck is by a ball-and-socket bearing, giving the trailer freedom to accommodate itself to the road conditions without affecting the truck.

The specifications vary according to the capacities, which are 5, 7½ and 10 tons. The tread is 65 in., wheels, second growth hickory and tires may be either the pressed on or demountable type. The springs are oil tempered and double heat treated. The axles are special forged steel and Bower roller bearings are used. The prices for the three capacities are $750, $950 and $1250 respectively.

THE LAURA AUTO TRAILER

The Laura auto trailer, which is being produced by J. F. Laura, Coldwater, Mich., is strong and well built. It can be attached in a few seconds and is light running and attractive. Sarven wheels, with riveted rims having 1⅛ x 5-16 in. tires are used, and carry a 1⅛-in. axle. Oil tempered springs are used, the rear being 6-leaf, 1½ x 40 in., and the side, 5-leaf, 1½ x 38 in. On these springs is mounted the body, which is 38 in. wide x 6 ft. 10 in. long and 7 in. deep, inside. It has also 5-in. flare boards and an end gate that swings free. The material used in the construction of these trailers is high grade and the finish is regular buggy style, in any color of the purchaser's choosing. The regular equipment is steel tires, but solid rubber tires will be furnished at a slight advance. The price is $37.50 f.o.b. factory and the net weight is 325 lb.



The Laura Trailer Attached to a Ford Runabout

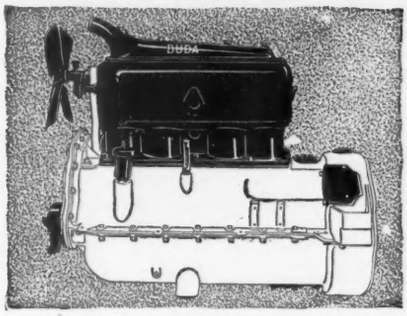
Car and Trailer Replace Stage Coach

The trailer is used to carry the baggage of passengers riding in the car. This outfit operates between Hawick Port and Hawick Station, Mass., and makes four trips per day

CONGRESS HAS BEEN REQUESTED to grant an appropriation of $100,000 for an automobile plant in connection with the Jeffersonville, Ind., Quartermaster's depot. The money is needed for additions to the present plant, which is intended to take care of the great number of motor trucks which the army will need; build the bodies, and if necessary, of complete trucks, and the repair of trucks sent in from the field.

For its readers—information; for its advertisers—results. That's the purpose of the CCJ

"LET US HAVE THE FACTS"—No. 4



MEAN EFFECTIVE PRESSURE

A high mean effective pressure is the physical demonstration of correctness of motor design, materials used, and methods of manufacture. More pertinently, it is an unfailing guarantee that a motor is highly efficient, economical in operation and exceedingly flexible.

The BUDA MOTOR

has an unusually high M. E. P. You or your engineer can verify this fact by visiting the Buda plant and making your own close, technical examination. Buda torque and power curves indicate the results you may expect. Together with detailed specifications, etc., they are in the new truck motor catalog.

As a preliminary step write us for it.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILL.

THE BUDA COMPANY
BUDA
MOTOR
"The part to buy the car by"
ESTABLISHED 1881

When Writing, Please Say—"Saw Your Ad. in the CCJ"

Quicker, Better and Cheaper Piano Delivery

Also to Greater Distances Before Calling on the Railroads

By C. P. SHATTUCK

AMONG the piano companies in New York City who have found by experience with various transportation methods that the commercial car affords that service now so essential in business, is Wm. Knabe & Co., a division of the American Piano Co., occupying warerooms at Fifth Avenue and Thirty-ninth Street. Before it adopted motor trucks in 1914, this company had relied upon horse-drawn equipment to haul its product from the freight terminals to the warerooms and to make deliveries. This work was performed according to a contract and included a scale of prices for both city and suburban deliveries. With horses the limit of delivery was 15 miles from the warerooms and not only was considerable time lost, but the method was expensive, as a crew of men accompanied each vehicle.

As competition became keener in the piano industry, and the public began to demand better service, a trial was made with motor vehicles, these being hired. The experiment proved so successful that an order was placed for three 2-ton Selden trucks and within a year a 1-ton Buick was added. In September, 1916, the fifth machine was placed in service, a 3-ton Selden.

By operating its fleet of trucks the company not only has increased the radius of delivery from 15 to 50 miles, or over 200 per cent., but is enabled to give its customers much better service, making deliveries to out of town sections on the same day a piano is purchased. As an example of the service obtained with the machines is a delivery made recently on a Saturday morning by one of the 2-ton Seldens. This car delivered pianos to Summit, Rahway, Plainfield and Bound Brook in New Jersey, in one trip, covering over 50 miles one way. Deliveries as far as Asbury Park, N. J., are not uncommon. The machines frequently go as far north as Mt. Kisco in New York State, and cover Rockland, Westchester and Putnam counties as well as to points beyond Oyster Bay on Long Island. Brooklyn and Queens county are productive of a considerable volume of business. In New Jersey deliveries are made within a radius of approximately 50 miles of Jersey City.

The machines are utilized also for hauling pianos, etc., from the railroad terminals and piers to the warerooms and to the warehouse at 442 W. Forty-second Street. Pianos are received from the factories at Baltimore, Md., and East Rochester, N. Y., at pier 26, North River, and the terminal of the New York Central. The instruments usually come boxed and are removed and the boxes sent back to the factory. It is not infrequent that a carload of 18 unboxed pianos is received. The hauls to the warerooms and warehouse are short, about a mile, and shipments are received about every other day except during the holidays, when a large volume of business is transacted. Although it has been contended that it is cheaper to utilize horses in hauling from the freight terminals, the use of trucks in this case has proved satisfactory.

The size and weight of pianos vary from an average of 700 lb. for the smaller instruments to 1640 lb., that of a concert grand and boxed. The loads carried by

Combines Publicity and Business

Illustrating the tendency to utilize special, highly finished bodies to advertise the wares of the user.

Selden Trucks Reduce Delivery Costs

Part of fleet serving William Knabe & Company, New York City, which has increased the radius of delivery from fifteen to fifty miles

Advertising appropriations bring greatest returns when expended in the CCJ

Took 12 years to perfect this truck

The fact that the Atterbury 1 Ton, 1½ Ton, 2 Ton and 3½ Ton Trucks are being bought in increased and repeated numbers by the country's greatest firms, is the natural result of the Atterbury's quality, due to over 12 years of progressive evolution.

MOTOR TRUCKS OF ATTERBURY MAXIMUM SERVICE

ATTERBURY

BUFFALO NEW YORK

the machines vary, the 2-ton Seldens hauling on an average four standard instruments and the 3-ton vehicle six of the concert grands. A mixed load may be hauled, including different types of instruments and Victrolas. Some idea of the service obtained with trucks may be obtained when it is stated that during the holidays the trucks have delivered as many as 50 pianos in a working day. This means that the instruments are loaded at the warerooms or warehouse, delivered and set up by the crews. The conditions obtaining with the delivery of pianos in New York City differ from those in the average city, for in New York six of every ten pianos delivered must be hoisted to the apartment, as the majority of apartments are of the non-elevator type or "walk-ups," as they are termed.

Each machine carries a crew of three men in addition to the driver, who assists in the work of loading, hoisting and setting up the instrument. The bodies are of the standard design used for the transportation of pianos, and each vehicle carries hoisting apparatus.

The Selden 3-ton truck, which has been in service about seven months, is equipped with a special body, which is 14 ft. long, 6 ft. 3 in. wide and 6 ft. 4 in. high. It has a 24 in. tailgate, and the front of the body is a solid panel, but has a sliding panel for observation purposes. The body is handsomely painted and the lettering is the design of the art department of the factory.

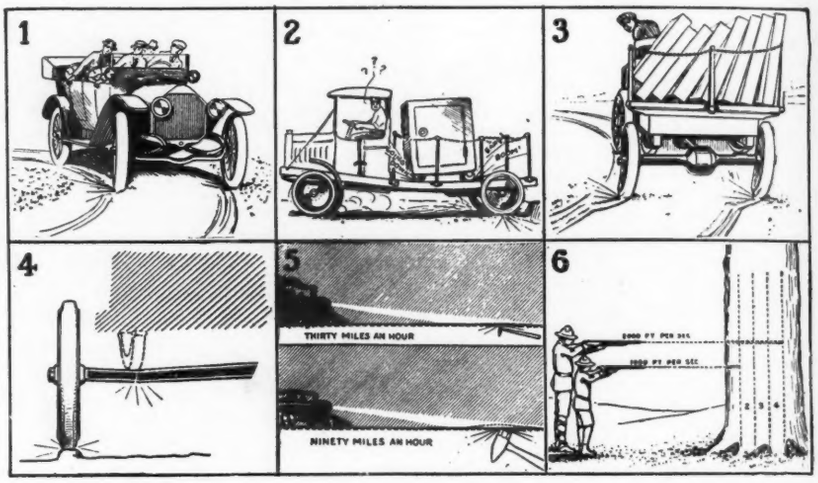
The company maintains its own garage and repair shop, the latter being in charge of the head driver. The routine is done by the superintendent of transportation, the machines being sent out according to the loads and destination. The routing is very efficiently handled and is so arranged that each vehicle is kept busy during the working day. The superintendent is constantly in touch with the drivers, so that if an order is received to call for a piano that is to be shipped away for a customer, a truck can call for the instrument without making an extra or special trip. These orders are frequently received. The system also has its advantages in that time is saved at the freight terminals by the driver reporting unavoidable delays.

The Seldens have given excellent service with a minimum cost of upkeep in spite of the large daily mileage. Owing to the fact that the former delivery service was contracted for, comparative cost figures were not given by the company, but it is stated that the trucks have brought about an economy in the costs of delivery. The possibilities of complaints with contract service have been eliminated for the Knabe crews are highly trained. But the greatest asset to the company is the service afforded in the face of competition, which would not permit of the use of horses were they more economical.

MILLER & CARPENTER, Cherryville, N. C., have been appointed as service station for the Philadelphia Diamond Grid battery, manufactured by the Philadelphia Storage Battery Co.

"LENGTHENING THE LIFE OF THE MOTOR TRUCK"

This is the title of an illustrated article published by the B. F. Goodrich Co., as an introduction in the fifth volume of "Motor Trucks of America," which is issued each year by the Goodrich Truck Tire Dept. An illustration from the article is shown herewith which graphically shows the reader the strains and stresses an abused truck is subject to. The Goodrich Co. has gathered data, classified it and stripped it of its technical trimmings, and put it in the language of the truck driver. This article has been made up in pamphlet form and is being distributed by the Goodrich Company.



Why Overloading and Overspeeding Will Ruin the Best Truck That Money Can Buy

Fig. 1. Rounding the curve. Fig. 2. Two times an extraordinary strain equals an accident. Fig. 3. The "skidding" strain. Fig. 4. Not time enough for the spring to act. Fig. 5. Three times the speed —nine times the blow. Fig. 6. What speed means!

After defining that much misunderstood term, "factor of safety," the article discusses the effects of overloading on every part of the motor truck. It then gives a comprehensive explanation of destructive work of overspeeding. Many people do not know, for instance, that an object having twice the speed of another of the same weight will perform four times as much work. Thus a bullet traveling 2000 ft. per second will penetrate a target four times as deep as one going at the rate of 1000 ft. per second. This principle is applied to the motor truck and it is shown further that a vehicle traveling at three times its normal speed will suffer shocks which are nine times more violent than normal.

The story now deals with the errors in driving which embraces the selection of gears, management of the clutch, lubrication, etc. It is unknown to many that a piece of steel, however smooth in appearance to the naked eye, will show under the microscope a rough surface. It is the function of the film of oil to fill these multitudes of indentations and actually prevent the surface of this part from coming into contact with the surface of its partner in work.

Since it is the driver who carries the destiny of the truck in his hand, it is necessary to approach and convince him that his job depends upon how strictly he adheres to the advice that is given him.

One of the surprising features in connection with this most interesting pamphlet has been the increasing number of inquiries from large business institutions operating salesmen's cars as well as extensive fleets of trucks, for the article applies as directly to the pleasure car as it does to the truck. Many of these large operators are placing this story in the hands of their drivers and superintendents in a determined effort to lengthen the life of their cars and trucks by eliminating the evils which have heretofore made operation and depreciation so costly. The saving which a close observance of these instructions will bring about is so vast that it is impossible to even suggest an approximate estimate.

V-BELT DATA

One hardly realizes the importance of the automobile fan and generator belt drive business until he has had the opportunity of glancing over the pages of the booklet, entitled "'V' Belt Data," issued by the Graton & Knight Mfg. Co., of Worcester, Mass.

The pages of this booklet show the need for standardization in this particular branch of automobile engineering. Aside from the different types of belts grouped under suitable headings, there is much general information contained therein of interest to the trade. The most important is the carefully compiled results of investigation following the outline of the plan for uniformity covering standardization of "V" belt angle minimum diameters, horsepower ratings of fans and transmission values of "V" belts.

REPUBLIC MOTOR TRUCK CO., Alma, Mich., is seeking a site in Los Angeles for the erection of an assembly plant. It is stated that 2,000 trucks will be built there the first year, and that 125 mechanics will be employed from the first.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

The Increased Demand for Trucks in Maryland

The Nine Counties of the "Eastern Shore" Are Rapidly Becoming Motorized

THAT there is a constantly increasing demand for motor trucks and motor busses in all sections of Maryland is evidenced by the spirited campaign which established dealers in the cities and larger towns throughout the State are conducting this season; also by the number of concerns that have recently entered the field. To-day every dealer of consequence in Maryland has a greater number of trucks in his display rooms than at any one time previous to, or since, the year 1914, which proved a record-breaking year for dealers, there being any number of motor bus lines and freight-carrying lines established during that period.

While it might appear that every preparation had been made by dealers to meet the demand for trucks and commercial cars this year, it is exceedingly doubtful if their supply will prove sufficient. In all sections of Maryland, more particularly those in which transportation facilities are unknown, the crying need of the hour is for interborough passenger and freight lines, and before the close of the year one may expect to see a number of such concerns operating in those regions. The mercantile interests, too, in rural Maryland are finding it necessary to supplant the horse with the delivery car and the heavy truck, and right at this time are placing their orders "thick and fast." Contractors and builders of State roads, concerns doing a haulage business, mill owners, plumbers, rural fire departments, farmers, nurserymen—all are adding trucks this season—which accounts for the preparations made by dealers in all sections to take care of present and near-future purchasers, and the activities of their ubiquitous salesmen.

In order that readers of the COMMERCIAL CAR JOURNAL who are interested in the growth and extension of truck service to the counties of Maryland may properly comprehend its magnitude it might be well to direct their attention to a few facts as they are known to the people of Maryland s

Long-Distance Hauling Van

Used by the Hampden Transfer Company, of Hampden, Md., a suburb of Baltimore City.

ruralities. That section of the State known as the "Eastern Shore," and which comprises the nine counties east of Chesapeake Bay, is now recognized far and near as one of the most progressive and productive regions anywhere in the United States. But a few years back it was scarcely known north of the Mason and Dixon line, nor is it deviating from a "straight line" to say that since its invasion and exploitation by dealers in motor vehicles its reputation and importance has become nation-wide. One does not have to hark back a decade to recall the first motor truck that found its way to the "Eastern Shore" regions. It was rather a small affair compared with many of the trucks now in use in that section, yet among its class it was up to the standard in every particular and every inch of it 100 per cent. efficiency. The advent of that little truck on the Maryland peninsula served to blaze the way for other popular makes, and from it has emanated a friendly rivalry between neighboring towns and villages as to which shall lead in the number of trucks and delivery cars in actual service at the close of the year. All of which, in the vernacular of the hustlers who represent the big dealers in the cities, is "easy money."

Fleet of Trucks Used by Contracting Firm

The Penn Construction Company, General Contractors, of Gavon, Md., is but one of the many of this kind of firm doing a profitable business. This concern started with two small trucks but is now operating five four-tonners, one three-tonner, one delivery car, two automobiles and one trailer.

No section of like area in the South can boast of a greater number of motor vehicles than are to be found today on the "Eastern Shore;" in fact, it may be said that the Maryland peninsula is fast becoming motorized. That it compares favorably with any section, North or South, in truck service—taking into consideration the fact that this service had its beginning barely ten years ago—cannot be gainsaid, and that the demand for this service is taking a shot skyward every day, not only on the "Eastern Shore," but throughout all Maryland, rural and otherwise, is attested by the president of one of the most widely known distributing concerns in Baltimore City who, upon being requested by the correspondent of the COMMERCIAL CAR JOURNAL for an expression of opinion as to the future of the motor bus in Maryland, replied that "the average Baltimore dealer is too busy selling trucks in the City and in the eastern and western shore counties, for commercial purposes, and rendering service on the trucks already sold to give

Everybody who is anybody in the truck industry reads the CCJ

any thought or attention to the development of the bus business."

To further emphasize the demand for truck service in the counties, but with no intention of giving undue publicity to any one, the representative of this journal finds it necessary to refer to a few concerns which owe their present prosperity to their motor trucks, the Penn Construction Co., General Contractors, with offices at Govans, Maryland, being one among many concerns of its kind in Maryland doing a "land office business" with its trucks. The Penn Co. was incorporated in April, 1915, to do a general contracting business, starting out with two or three small trucks. From the moment the company announced to the public that it had entered the contracting field the wheels began turning, since which time the business has increased by such large leaps and bounds as to necessitate an increase in rolling stock. The company is now operating six heavy trucks—five 4-tonners and one 3-tonner—one delivery car, two automobiles and one trailer. For two years, including 1917, the company has had contracts with the State Roads Commission to haul most of the grit used in preparing the roads for their annual oiling, and at the present time other contractors are besieging it to take contracts to do their hauling either on the ton mile basis or hiring them the trucks direct. The present truck equipment of this concern does not meet its requirements by far and within a short time other heavy trucks will be added.

In Both Long and Short-Distance Hauling the Truck is Very Popular

Another concern that is constantly adding to its rolling stock is the Hampden Transfer Co., of Hampden, a suburb of Baltimore City, its long distance hauling in the counties and beyond the Pennsylvania-Maryland Line having assumed abnormal proportions this season. The National Building Supply Co., of Baltimore City, which handles any and everything that its name implies, not only operates a large fleet of heavy trucks but recognizing the demand for truck service in every nook and corner of the state, has accepted the general agency for Maryland for the Lippard-Stewart product, which it is scattering to the four corners of the state.

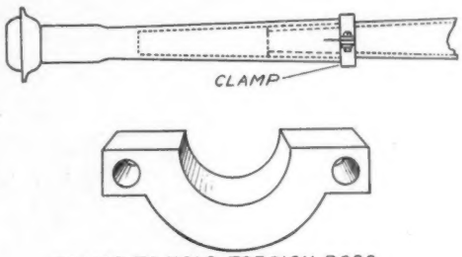
Fire departments in rural sections also are demanding motor hose wagons of the type shown in this article, of which the Fire Department of Baltimore City has any number, with Cumberland ranking second. Also Hagerstown, Frederick, Annapolis, Towson, Cambridge and Salisbury have added them to their respective Fire Departments, the multiplying of many storied structures, and the unbroken rows of dwellings in many sections of those towns demanding that the very best methods of fire control from the standpoint of efficiency and prompt availability shall be provided.

And the demand for motor trucks throughout all Maryland was never so great as it is today, with 10 to 1 chances that they will be even in greater demand before the close of the present year.

LENGTHENING THE WHEELBASE ON A FORD CAR

The way we lengthened the wheelbase on a Ford grocery delivery was different from anything that I have seen described. Originally the truck body was too long and overhung the chassis about 4 ft., so that the load was very unequally distributed, and when overloaded, as most trucks usually are, the extra weight so far back caused the sills of the body to break.

First we removed the body and the rear axle system. The rear cross frame member was then removed by cutting the rivets and laid aside. A new frame side member, cut in two in the center, made two side extensions, with taper ends, each 50 in. long, and when slipped over the ends of the old frame, gave an extension of 20 in. exactly. However, to make the extensions fit perfectly, we had to cut 4 ft. off the large end, on account of striking the running board brackets. This extra 4 in. did not affect our



Torsion Rod Clamp
Made of iron, drilled and bent, and clamped to drive-shaft housing

measurements, as the extensions drove on tight to the taper on the frame, and still gave us the required 20 in. extension.

These extensions were then bolted in place with ⅜-in. capscrews, the rivet holes in the frame being reamed out to ⅜ in. We used as many of the old rivet holes as possible to avoid weakening the frame by too many holes. We put three bolts in the top, three in the side and two in the bottom of each splice. The end of each extension was split and a lip turned out to fit the new style rear cross-member, which was fitted in place, using ⅜-in. capscrews instead of rivets. In fact, there were no rivets used on the job anywhere.

The old cross-member was then bolted in the frame amidships, just behind the gasoline tank, to serve as a reinforcement. This completed the work on the frame.

The drive shaft housing and assembly was then removed from the rear axle system, and the drive shaft taken out. The ball joint end was sawed off where the tubing enters it, and the front drive shaft bearing knocked out. Another new drive shaft housing was secured and the flanged end sawed off, or just 3 in. taken from the large end. The large end was split with a hacksaw for about 2 in. and a clamp forged to go around it to hold it more securely in place when finished. The new housing was then driven on over the old one, and, both being tapered, they made a good fit when driven together, as shown in the sketch. The drive shaft was then cut off just behind the square on the universal joint end and a section 24 in. long was cut off an old drive shaft and welded on.

To save machine work the squared end was used as the extension, and when welded up the completed shaft was just 19⅞ in. longer than the regular length. It was then trued in the lathe, which was all the machine required. Few blacksmiths can successfully weld vanadium steel, and unless extreme care is taken the weld will not hold, though it may look good on the outside. The weld must be made at a low welding heat, and several heats taken to insure a good job, and the weld well hammered in finishing up.

The drive shaft was next assembled in the housing. If there is any small error in the shaft length, the pin holes in the universal joint may not line up with the holes in the shaft. This is easily remedied by shifting the drive shaft housing extension forward or back, as the case may be, until the holes register. The pin is then driven in and the clamp on the housing drawn tight and the housing assembled with the rear axle. A piece of soft iron 1½ in. wide, 1 in. thick and 6 in. long, was bent and drilled as shown to carry the torsion rods. This was clamped over the drive shaft housing and the torsion rods bolted in place. The brake rods were welded out to the necessary length and the entire rear system installed in the chassis in the usual manner, and the job was finished aside from putting on the body.

This method of lengthening the car does not change any vital part of the car except the drive shaft. It is not expensive, as all that is required is one new side member for the frame, one rear cross-member, one drive shaft housing and one old drive shaft and two dozen ⅜-in. capscrews and nuts. It required about 10 hours' labor for two men and a helper to complete the job, and no special tools or equipment, as there is no machine work at all except truing the drive shaft, and that can be dispensed with.

This truck has been in service some few months, making an average of 35 miles per day and carrying an average load of 800 lb. in addition to two men, without any trouble of any kind.

MICHIGAN COPPER & BRASS CO., Detroit, and the United Motors companies. At the annual meeting recently held only three members of the company's old board of Mich., has passed into the control of executives of various of the General Motors directors were re-elected: D. M. Ireland, James T. Whitehead and Alfred L. Simmons. The new directors are C. S. Mott, Walter Chrysler and H. J. Mallory, Flint; Alfred P. Sloan, Jr., New York; E. E. MacCrone and Hal H. Smith, Detroit. These men succeed Fred M. Alger, George H. Barbour, Benjamin F. Brusstar, E. J. Corbett, Jeremiah Dwyer, William A. Gorby, James E. Danaher and Fred T. Moran, who have sold their holdings. The officers are D. M. Ireland, president; James Whitehead, first vice-president; Hal H. Smith, second vice-president; Alfred L. Simmons, secretary; John L. Connell, treasurer. David Burgess is general superintendent. Extensions to the amount of $200,000 will be made to the plant.

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THE PUBLISHERS' PERSONAL PAGE

Pessimism is Treason

THOSE are strong words, but as applied to the present situation in this country they are used very advisedly. Broadly defined, treason is any act aiding the enemy. Under the existing circumstances, plans of all our fortifications would be of no advantage whatever to Germany as compared with an impairment of our financial strength.

As we have said before, prosperity is very temperamental; it gets offended and goes away when its feelings are hurt, and nothing hurts its feelings more than doubt and distrust. Otherwise put, the plain facts are that thinking hard times makes them, and confidence in the approach of good times or the continuance of their existence, just as surely brings or holds them. Fear that business is going to suffer when all the signs are to the contrary, is rank pessimism, and hence, getting back to our first premise, is positively treason.

Not only is it not patriotic, but it may be said to be even idiotic, to be pessimistic over the business prospect when seven billion dollars are to be put in circulation, practically all in this country.

Quoting from an editorial that appeared in the *Philadelphia North American*, extracts of which are given elsewhere in this issue: "It was the expenditure of the first fifty million dollars on materials for the allies that started the business of the country booming; when it was realized that they would need one billion dollars worth of our products, the flow of prosperity became a torrent; the force of that is still felt, and now it is to be multiplied seven times."

Patriotism Abounds

Patriotism is still a predominating trait of all true Americans, and there are more of the latter today than ever before. We expect it in individuals, but it is more surprising in the corporations, large and small, which have been showing themselves far from "soulless." Witness how universally they have offered their plants to the Government for such use as may be needful; one of them, a large railroad, is about to reduce its number of passenger trains to make more freight transportation possible as a help in this crisis; those who make supplies for the army are going to do it at cost plus only a moderate profit, and some of them will even waive all profit; engine, transmission and truck manufacturers, regardless of possible disadvantage to themselves individually, are arranging to use interchangeable engines and transmissions in military trucks, to more quickly supply them to the Government and minimize subsequent loss of their use; and so we might go on and mention the large companies that have promised to employees a part or all of their wages during their absence if they enlist for military duty or as agricultural helpers in harvest time, as well as the firms that have purchased bonds for their employees, to be paid back on the instalment plan.

There is a pessimism of another kind that should receive its quietus by demonstrations of the fealty in time of stress of those the muckrakers have been pleased to call "creatures of predatory wealth." If the response from the people as a whole measures up to that of the much-maligned moneyed class, the nation will have nothing to fear in the outcome of the war.

It may well be one of the fortunate consequences of our being drawn into the European conflict, that the masses may get a truer perspective of the classes and *vice versa*, and thus avert what was imminent in a few years, had the old conditions continued—a social revolution.

Cynics Rebuked

A rebuke to the cynics has been the coöperation of the leaders of the various industries, most of them representatives of the soulless (?) corporations, who are giving their time with no compensation, and in many cases even at personal expense for offices, correspondence, etc., that the Government may have the benefit of their priceless experience. It is very safe to say that were the Government to be paying these men salaries, commensurate with the incomes they would receive in their regular business connections it would represent a staggering sum. It is not this fact, however, that is so gratifying, as the spirit behind it which prompts these men to give their services in this patriotic way. Second only is it to the patriotism displayed by those who have enlisted for actual service at the front, for "Greater love hath no man than this, that he lay down his life."

We cannot all go to the trenches, many of us can contribute very little individually to the financial aid of the Government by purchasing bonds, but we can all, from the greatest to the least, forbear the utterance of gloomy or even dubious comments relative to the business future. Better if we think such thoughts, to inform ourselves and see how groundless they are, and then spread the knowledge we have gained to help suppress all manifestations of pessimism.

We must not only think optimistically, but we must talk and live that way also. If we say we believe that prosperity will continue, and hoard our money, we are hypocrites and as bad as traitors. Our being at war should not be made the excuse for withholding any contemplated expenditure, but the more reason for making it, for when we spend we show confidence in continued prosperity.

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Optimism is Patriotism

"WE operate eight motor trucks and the Autocar is the handiest truck we have," says the Shanahan & Elliot Ice Cream Co., of Philadelphia. "It averages 50 to 60 miles a day, and its remarkably short wheelbase for two tons capacity enables it to get in and around the narrowest streets to make deliveries. We have just bought a second Autocar and expect to get more this spring."

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